

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World.

Founder and Editor : STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 704. (No. 25, Vol. XIV.)

JUNE 22, 1922

[Weekly, Price 6d.
Post free, 7d.]**Flight,***The Aircraft Engineer and Airships*

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C. 2

Telegrams: Truditor, Westcent, London. Telephone: Gerrard 1828

Annual Subscription Rates, Post Free:

United Kingdom .. 30s. 4d. Abroad .. 33s. 6d.*

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates

* European subscriptions must be remitted in British currency

CONTENTS

	PAGE
Editorial Comment	
The Parseval "P.L. 27"	349
The Empire Airship Scheme	350
A Seaplane Service at Last	350
R.A.F. Aerial Pageant	351
Royal Air Force Dinner	352
Royal Aero Club Official Notices	353
18-Ton Parseval Semi-Rigid Airship "P.L. 27"	354
New British Air Service	358
Air Ministry Notices	358
Correspondence	358
London Terminal Aerodrome	359
The Independent Air Force Dinner	360
London-Continental Services	361
Some Aspects of Aeronautical Research: By Col. A. Ogilvie	362
Royal Air Force	363
Royal Air Force Intelligence	363
In Parliament	363
Models	364
Side-Winds	364

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

1922.

June 23-25 International Competition for Touring Aeroplanes, Brussels

June 24 Royal Air Force Pageant, Hendon

June 27 Royal Aero Club 21st Anniversary Banquet

Aug. 6-20 French Gliding Competition

Aug. 6 Gordon-Bennett Balloon Race, Geneva

Aug. 7 Aerial Derby

Aug. (last fortnight) Schneider Cup Seaplane Race, at Naples

Sept. Tyrrhenian Cup, Italy

Sept. Italian Grand Prix

Sept. or Oct. R.Ae.C. Race Meeting, at Waddon

Sept. 22 Coupe Deutsche (300 kil.)

Dec. 15-

Jan. 2 Paris Aero Exhibition

1923.

Dec. 1 Entries Close for French Aero Engine Competition

1924.

Mar. 1 French Aero Engine Competition.

EDITORIAL COMMENT.

THE article describing and illustrating the Parseval "PL27" semi-rigid airship which is published in this issue of FLIGHT was written several months ago. Lack of space has prevented publication until now. In the meantime, the airship scheme proposed by Commander Burney, backed by Vickers, Ltd., and the "Shell" group, has been brought forward. This scheme, as is, of course, well known to readers of this journal, includes the use of rigid airships. In the article on the Parseval, written before the publication of the Burney scheme, it is suggested that possibly the rigid is not the only, nor even the best, solution. While we have not the slightest desire to interfere in any way with the new scheme, which is still under consideration, we think that the opinions expressed in the article may still hold good, without prejudicing in any way the more ambitious programme suggested by Commander Burney. There is still the further consideration of the possibility of the scheme being turned down on financial grounds, after consultation between the Air Ministry and the Treasury. If that should come about (we trust it will not), it might still be found possible to find a solution of the airship problem by turning attention to the use of smaller ships to be built in England.

It has been stated by acknowledged experts—and so far as we are aware, the statement has not been contradicted or proved wrong—that as regards cost it is possible to build a semi-rigid airship similar to the "PL27" for about £30,000, or about one-sixth the cost of a rigid of approximately two million cubic feet capacity. If that be a true statement, it would appear that a scheme which contemplated the use of semi-rigid ships would start with an initial advantage of lower first-cost, which would give us an extra million cubic feet capacity for the same money. Translated into pounds of cargo, this would mean, assuming a proportion of useful lift to total lift of 50 per cent. and 65 lbs. lift per 1,000 cubic ft. of hydrogen, 32,500 lbs. of extra cargo capacity for each two-million cubic feet rigid, and for the same original outlay. That is certainly an item worth taking into consideration, and should be given very

serious thought before we decide definitely to abandon all thoughts of running airship services.

With reference to the operational side of such a service, we have no information relating to cost of running, but there does not appear to be any reason to think that a service with semi-rigids would be much more expensive to run than one operated with rigids. The crew of each semi-rigid would be smaller, although for a certain total tonnage it might be found that the aggregate was slightly larger, than that of a service operated with rigids. Against that must be placed, however, the lower first cost, and the fact that with six semi-rigids instead of each rigid, we should not be putting all our eggs in one basket, so to speak. Furthermore, as pointed out in the article, the smaller airship, if forced to descend, can be deflated and sent home by steamer or rail. If a rigid is forced down and comes into contact with the ground it is practically certain to become a total wreck.

In one respect, the rigid undeniably scores, and scores heavily: that is, in the matter of range. If we are contemplating non-stop journeys of 2,000 miles or more, there appears to be nothing for it but to use the rigid.

The Empire Airship Scheme

Much will depend upon the Government decision with reference to the suggested airship scheme. If the Treasury should turn down the proposal on financial grounds, there is, as we have already mentioned, a possibility of an alternative scheme, based upon the use of smaller ships. If, on the other hand, the Government decides to accept the Burney scheme, it may be taken that large rigids will be the craft used. It now appears, as we ventured to prophesy some time ago, that there is going to be actual competition between the Air Ministry on the one hand and the Admiralty on the other for the control of airships. So far as is known, nothing has been settled yet, but the situation is not without humour. It is not so very long ago that the Admiralty, who then had control, decided to abandon airships altogether, on, it was stated, financial grounds. The airships were then turned over to the Air Ministry, who ran them half-heartedly and very nearly went bankrupt in the process, having ultimately to announce a decision to scrap all airships and hand them over to the Disposal Board. Efforts were made to get the decision altered, but without much success. Major Scott, our cleverest airship pilot, and one of our greatest practical authorities on airships, stated, in his paper read before the Air Conference, that in a couple of years' time we should have to resume airship construction whether we liked it or not. His prophecy already looks like coming true, much sooner than probably even Major Scott expected. Captain Guest at the same time announced that it had been decided to abandon airships, making the fallacious statement that it would be as cheap, in the long run, to resume airship design and construction in ten years, a statement which aroused contradiction from every quarter, and was characterised by one speaker as "brainpicking" and scarcely dignified to say the least of it.

There are now indications that both the Air Ministry and the Admiralty have discovered that they *can* afford airships, or perhaps we should say that they have discovered that they cannot afford

not to foster them. As to which of the two should have control of airships, opinions will probably be divided. Personally, we have always held that by its very nature the airship should come under the Admiralty. The airship, especially the large rigid, is the long-distance, trans-oceanic craft *par excellence*, and its handling, the training of its crew, as well as its uses during war, appear to be pre-eminently those connected with the Navy. The future of the airship as a long-distance naval scout appears to be fairly well assured by the introduction of non-inflammable gas, which will reduce its vulnerability. The introduction of heavy-oil engines as the power plant is almost within sight, which should remove the second possible source of danger from fire, and thus the airship becomes a craft of vast possibilities. In addition to its functions as a scout, there appears to be good reason for believing that before long it will be possible to use the large airship as an aircraft carrier of extraordinary mobility. Thus the more one looks into the airship question from the war purpose point of view, the more does it appear that airships should come under sway of the Admiralty. Our one objection, perhaps, is that it *might* mean the thin end of the wedge for a dual aeroplane service once again. We, therefore, look forward with keen anticipation to the final issue between the Admiralty and the Air Ministry for control of lighter-than-air craft, the utility of which both had previously questioned.

A Seaplane Service at last

After the campaign for developing the seaplane which FLIGHT has been conducting so vigorously during the last few months, it is naturally with considerable satisfaction that we learn of the Air Ministry's "approval" of a service between Southampton and Cherbourg and Le Havre, with a subsequent service between England and the Channel Islands. The new firm to operate this line, it is stated, will be known as the British Marine Air Navigation Co., Ltd., and as mentioned elsewhere, the London and South Western Railway Co. is actively interested in the undertaking. The service is to be run by Supermarine flying boats, which have an excellent reputation for seaworthiness as well as good flying qualities. We congratulate the Supermarine Aviation Works upon their success, and would take this opportunity of pointing out that the recognition afforded by this new departure is but the just reward of Mr. Scott-Paine and Commander Bird for their unfaltering faith in the seaplane and their courage in persevering, in spite of the greatest difficulties, in keeping their works running purely as a flying-boat manufacturing establishment. We sincerely hope that this is but the beginning of the official and commercial recognition of the seaplane.

We have repeatedly pointed out that seaplanes should be more economical to run than fast land machines over a route like London-Paris. This appears to be borne out by the subsidy which is being granted to the new company. We not only wish the new company every success, but are quite confident that success will be its ultimate reward. At first, it is to be expected that there will be difficulties, but we do not doubt for a moment that these will be overcome.

THE R.A.F. AERIAL PAGEANT

ON Saturday this week, the third Aerial Pageant, which is organised by the Royal Air Force for the benefit of the R.A.F. Memorial Fund, will be held at Hendon Aerodrome. From the advance reports to hand, it would appear that this year's arrangements will be even more attractive than ever—although looking back on the previous displays one really wonders if such a thing is possible! The considerable increase in the number of visitors at last year's display, as compared with the previous one, is expected to be even greater this year, and further special arrangements have been made as regards accommodation. The enclosures have again been increased in size—sufficient for 100,000 people to witness the pageant in comfort—and well-organised motor-car parks will enable a large number of motorists to take up good positions with ease. Three main parks will be used for this purpose, one reserved for large limousines only, one for open touring cars only, and the third for light cars. The admission fee for cars will be 5s. Char-à-bancs will also be admitted at the rate of 10s. per char-à-banc and 2s. for each occupant. Motorists are advised to approach Hendon via Golders Green, and Hendon village. The prices of admission are 2s., 5s., and 10s.—tickets for the last two enclosures being obtainable, if desired, through the usual agents or from the Hon. Sec., R.A.F. Memorial Fund, 7, Idlesleigh House, Caxton Street, S.W. 1.

The traffic arrangements, which will be under the special control of Scotland Yard, are being greatly extended by the following operating companies.

A third class ticket costing 1s. 3d. only is being offered by the Midland Railway Co., which is available by the following trains which leave St. Pancras at 12.23 p.m., 1.30 p.m., 2 p.m., and 2.5 p.m., arriving at Hendon about 25 mins. later. The last train is a special one, and extra accommodation is being provided on the other trains mentioned.

The Underground is also co-operating with greatly increased services by tube, bus and tram. The tube service to Golders Green is being greatly augmented, and a special bus service will be run from Golders Green Station direct to Hendon Church which will bring spectators to within a few minutes' walk of the aerodrome.

The following regular bus services are also being added to: No. 13 from London Bridge; No. 43a from Liverpool Street, and the 142 service on the Watford route.

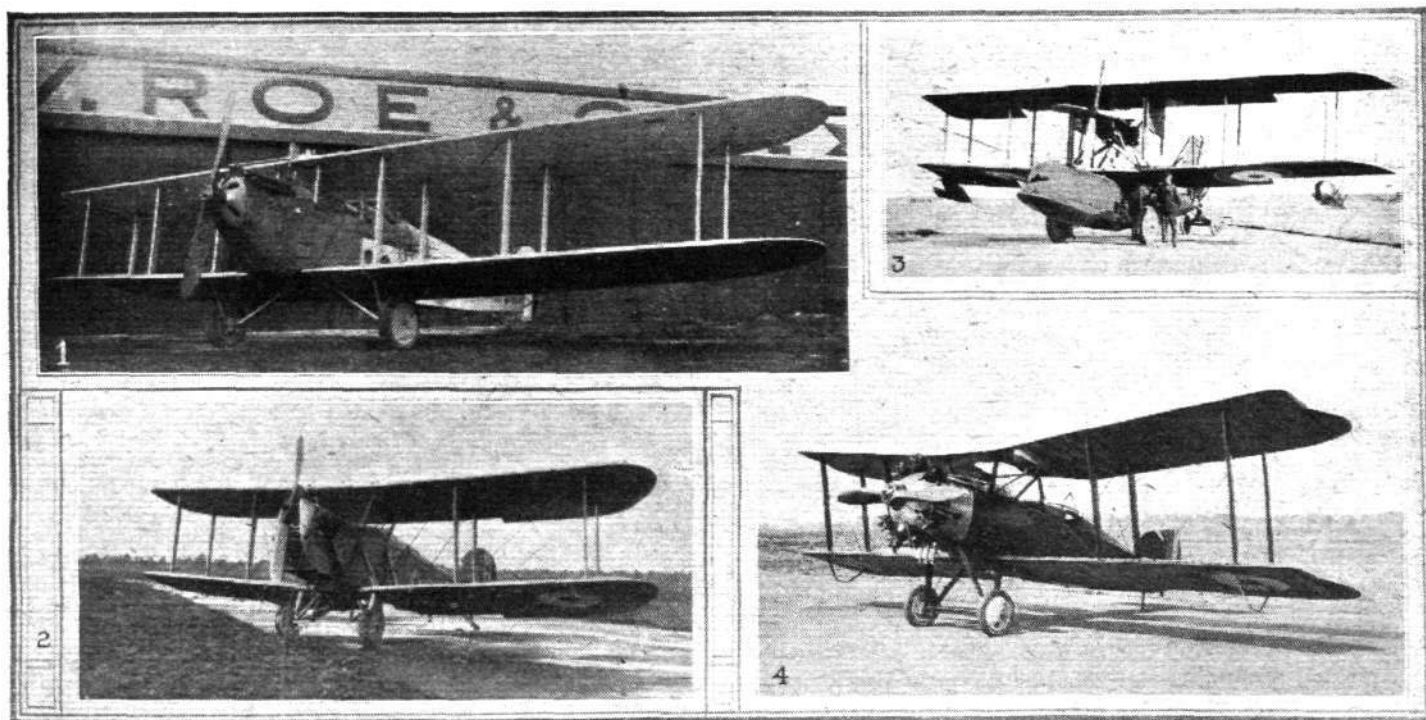
An increased service is also being run by the Metropolitan Railway to Willesden Green Station, from which point special tramway connections are being run to Colindale Avenue, Hendon.

As regards the programme itself, it is difficult to pick out any one individual item for special mention, so it will suffice if we give below a brief summary of the proceedings.

The pageant will commence



THE R.A.F. AERIAL PAGEANT: The "striking" poster issued by the organisers, depicting the star turn on Saturday's programme.



THE R.A.F. AERIAL PAGEANT: Four interesting machines which will make their first public appearance at the Pageant. (1) The Avro "Aldershot" (650 Rolls-Royce "Condor"), designed for long-range duties. The fuselage has two decks, or floors. (2) The Blackburn "Dart" torpedo-carrier, with Napier "Lion"; specially designed for alighting on a ship. (3) The Supermarine "Seagull" (Napier "Lion"), an amphibian flying boat. (4) The Westland "Weasel," a fighting and reconnaissance machine fitted with either a 380 Bristol "Jupiter" or a 320 Siddeley "Jaguar."

at 3 p.m., but various preliminary events will start shortly after noon. The R.A.F. Band will play from 1 p.m., and the gates will be open from 11.30 a.m.

In the earlier part of the day, a photographic competition between R.A.F. units will be held and pictures of set "pin points" of interesting objects surrounding Hendon will be taken from the air. Copies of these photographs will be sold on the ground within a short time after they have been taken.

The programme has been specially devised in order to show the public all the most representative types of British aircraft engaged in various duties in the R.A.F. It is of interest to note, also, that for the first time, marine aircraft—working with or for the Navy—will be on view, and will demonstrate by actual flying the development which has taken place in this class of aircraft.

Another new feature is a landing competition, for which a part of the aerodrome, about 100 yds. square, is being specially marked off with a fence 4 ft. high, consisting of light posts and fabric, representing hedges. The competing pilots are required to ascend above 1,000 ft., and on arriving in the course of their descent at 1,000 ft. they are to switch off their engines, and to complete the landing into the special enclosure, simply by means of their controls and without using their engines again. Any pilot who uses his engine below 1,000 ft. will be disqualified, as will any who touch the fence in the course of landing. Pilots are at liberty to bring in their machines by any of the many possible ways, so that a useful demonstration of side-slipping, spiral turns and other forms of gliding will be shown. It should also make clear the comparatively small space which the modern aeroplane requires in order to land safely and quickly.

The demonstration of "crazy flying," which proved so popular last year, will again be featured, this time by Flight Lieut. W. H. Longton, D.F.C., A.F.C. It may be mentioned that various freak machines will demonstrate from time to time. A demonstration of "writing in the sky" should be another popular item. Here the spectators will be able readily to follow the rapid movements of a machine looping, spinning and rolling by the trail of smoke left by the machine. Following this demonstration, there has been arranged further illustration of the uses of smoke in air warfare, and the machines engaged will produce a novelty in the way of coloured smoke clouds.

A well-rehearsed and extremely difficult event will be a demonstration of "follow-my-leader" in the air, in which two machines will carry out intricate aerial manoeuvres practically simultaneously and with the one following the other at a distance of not more than a few yards—it will, in fact, be synchronised stunting.

An instructive item will be a representation of low bombing in which a tank will be the objective of the bombers. A formation of machines will dive down and drop their bombs—practice type—with a high degree of effectiveness.

During the afternoon, three series of races will take place. In the first, the event will be confined to standard Avro machines, the competitors being the most skilled pilots from different units of the R.A.F. at home. The second race, which will follow a little later, is a handicap race between twelve different types of machines, the scratch aeroplane being one of the latest reconnaissance machines which has not so far been flown in public and the first off the mark, the Avro. This race will provide an interesting exhibition of a very complete collection of land types of aircraft used in the British Air Force, ranging from machines of tiny wing capacity to others whose planes are of large dimensions. Twin-engined machines will take part as well as those with one power unit only. The power of the engines will vary almost as much as the size of the machines.

The last race will be a relay one between home squadrons and stations, each flying three types of machines, the speedy Snipe, the Bristol Fighter, and the Avro training machine. In each of these races the course will be approximately 12 miles out and home, and it has been so arranged that in each of the events the flights will take place within full view of the spectators.

The most spectacular item which will take place just before the end of the programme will consist of a massed aerial attack on a desert stronghold erected on Hendon aerodrome. It will illustrate the type of work on which the R.A.F. has already successfully engaged as an independent force in Somaliland during the operations in 1920 against the Mullah. At that time the Mullah's forces at Modishi and Fort Jidili were located and bombed, and machines descended to low heights and inflicted heavy casualties on the fleeing Dervishes and their stock. The fort at Hendon, it may be mentioned, has been erected of large wings of obsolete aeroplanes. Palm trees, loopholed minarets and outlook towers will rise to a height exceeding 100 ft. from within the high-walled fortress, from which the muzzles of field guns can be seen protruding. The defenders in their varicoloured Eastern raiment will add an additional touch of colour to the scene. For fifteen minutes a thrilling aerial battle will be waged between a heavily-armed squadron of bombing aeroplanes and the defenders of the fort, who will reply to their attackers with intensive bursts of anti-aircraft and machine-gun fire, and finally, as the formation approaches to close quarters, with a broadside of field artillery. The culminating thrill of this engagement will be reached when one of the attacking machines is hit by anti-aircraft fire, and spins towards the ground enveloped in flames. The rescue of the pilot from his burning machine and the final destruction of the fort will mark the conclusion of what should produce an illustration of actual desert warfare as near to reality as ingenuity can make it.

It is to be hoped that the Meteorological Office, Air Ministry, has arranged for special weather conditions on this occasion!

THE ROYAL AIR FORCE DINNER

Formation of a Dinner Club

THE arrangements for a Royal Air Force Dinner for all officers who have been or still are connected with the Flying Services, on the night of Friday, June 23, as a preliminary to the R.A.F. Pageant at Hendon on June 24, are proving highly successful. It takes place at the Connaught Rooms, and nearly every unit that existed during the War will be represented, including R.N.A.S., R.F.C., R.A.F., Balloons, Ground and other allied services. All those belonging to the same formation will be seated together, but in all probability one will meet as many friends belonging to other units as one's own, because so many served in a number of different units at various periods of the War.

It is expected that many senior officers of the Royal Air Force will be present, and it is particularly hoped among these to collect together all those who served in 1914-15, especially those who went out with the original historic four squadrons.

In all probability the occasion will be perpetuated by the formation of a dinner club to hold an annual gathering. This will enable all concerned to meet many more friends than would otherwise be possible, and, what is important in these days, they can do the Pageant and their annual squadron or depot dinner for the one rail and hotel bill. Incidentally, the railway companies will issue week-end tickets at fare and a third from 5 p.m. on June 23, if over 15s. in value (or 30s. if first class), and as the dinners are timed to begin at 8.15, many who come from a distance

will be able to make use of this concession by re-booking at an intermediate point *en route*.

A few squadrons are also holding separate dinners simultaneously, and for these the Pageant itself will provide a meeting-place for all next day.

These units comprise the old Sixth Brigade, which will hold its dinner at the Connaught, where also No. 8 Squadron will be situated. Nos. 11 and 12 are dining together at the Hotel Cecil, where will also be No. 20 Squadron and No. 62 Squadron, both well-known fighting units. At Prince's Restaurant there will be No. 47 Squadron and two famous Scout Squadrons, Nos. 24 and 80; whilst at the Holborn Restaurant there will be No. 216, an old R.N.A.S. unit. At the Savoy No. 4 Squadron will meet, and in addition, at various restaurants at present unsettled there will be Nos. 59 and 205 Squadrons, No. 8 Seaplane base, No. 1 Balloon base. In addition, the W.R.A.F.s are holding a dance at Caxton Hall on Friday, and another is being organised in aid of the R.A.F. Memorial Fund on Saturday night, at the London Country Club at Hendon.

The price of tickets for the Royal Air Force Dinner at the Connaught Rooms is 10s., exclusive of wines and cigars. Those who wish to attend should wire "Emtage, Taxomobile, London," stating their favourite unit, at once, as seating accommodation cannot be guaranteed for all at this late stage. Seats booked must be paid for whether used or not, as it is impossible to cancel the catering arrangements.

THE ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS

COMMITTEE MEETING

A Meeting of The Committee was held on Wednesday, June 14, 1922, when there were present: Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., in the Chair; Mr. Ernest C. Bucknall; Lieut.-Col. F. K. McClean, A.F.C.; Lieut.-Col. Alec Ogilvie; Lieut.-Col. Mervyn O'Gorman, C.B.; Mr. T. O. M. Sopwith, and the Secretary.

Election of Members.—The following new Members were elected:—

Gwyn Howard Davies. Louis de la Garoe.
Hugh Raymond Vaughan Fowler. Paul Grosfils.

Schneider Cup, 1922.—The Secretary reported that an entry had been made for the Schneider Race, to be held at Naples on August 12, 1922.

Gordon Bennett Balloon Race.—It was reported that the following entries had been made for the Gordon Bennett Balloon Race, to be held at Geneva on August 6, 1922:—

Lt.-Col. John D. Dunville, Mr. E. Allen, Mr. Griffith Brewer.

Aviation Patents.—Correspondence between the Club and the Aero Club de France on the question of the R.E.P. Patents was submitted. As this affected British machines racing in International races in France, it was decided to press for an early decision.

Sub-Committees.—Reports from the following Committees were received and adopted:—

Racing Committee, House Committee, Banquet Committee, Flying Services Fund Committee.

RACING COMMITTEE

A Meeting of the Racing Committee was held on June 9, 1922, when there were present: Maj.-Gen. Sir W. S. Brancker, K.C.B., in the Chair; Lieut.-Col. M. O. Darby; Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S.; Col. F. Lindsay Lloyd, C.M.G., C.B.E.; Lieut.-Col. F. K. McClean, A.F.C.; Mr. W. O. Manning, and the Secretary.

Whitsuntide Races, Croydon.—The report of the races was received and approved. The question of holding further race meetings at Croydon was discussed.

Aerial Derby.—It was decided to hold the Aerial Derby on Bank Holiday, August 7, 1922, instead of Saturday, July 29, as previously announced.

The question of the course and starting and finishing place was discussed and deferred.

ROYAL AIR FORCE PAGEANT

The R.A.F. Pageant will be held at the London Aerodrome, Hendon, on Saturday, June 24, 1922. Tickets, 10s. (motor-cars, 5s.), may be obtained from the Royal Aero Club.

A special enclosure in the 10s. Paddock will be reserved for the Members of the Royal Aero Club and the London Country Club.

Members of the Royal Aero Club will be honorary members of the London Country Club, Hendon, on the day of the Pageant. Membership cards must be produced. Tables for lunch should be booked in advance. Price of luncheon, 4s. 6d. Telephone, 260 Kingsbury.

A Pageant Banquet and Dance in aid of the funds of the R.A.F. Memorial will be held at the London Country Club the same evening, commencing at 8.30 p.m. Tickets, £1 1s. each, may be obtained at the Royal Aero Club. The ticket includes free transport from Golders Green to the London Country Club and from that Club to town.

TWENTY-FIRST ANNIVERSARY BANQUET

As already announced, the Twenty-first Anniversary Banquet will be held at the Savoy Hotel on Tuesday, June 27, 1922, at 7 p.m. for 7.30 p.m.

The Navy, Army and Air Force will be represented respectively by Vice-Admiral Sir Rogers Keys, Bart., K.C.B., K.C.V.O., C.M.G., D.S.O., Lieut.-Gen. Sir Travers E. Clarke, K.C.B., K.C.M.G., Quartermaster-General, and Air Chief Marshal Sir Hugh Trenchard, Bart., K.C.B., D.S.O. Other guests include Lord Weir, Capt. The Right Hon. F. E. Guest, C.B.E., D.S.O., M.P., The Right Hon. Lord Gorell, C.B.E., M.C., Maj.-Gen. Sir W. S. Brancker, K.C.B., and The Duke of Sutherland.

The President of the Club, The Duke of Atholl, K.T., D.S.O., will preside, supported by Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Chairman, and Lieut.-Col. F. K. McClean, A.F.C., Vice-Chairman.

The Toast of the evening, "Aviation," will be proposed by The Lord Weir.

Members who have not yet done so are requested to apply for tickets for themselves and friends at the earliest possible moment. Tickets £1 1s. each.

NOUVELLE COUPE MICHELIN

(International Contest—Under the Regulations of the F.A.I. and the Aero Club de France)

Prizes: 100,000 francs (20,000 francs per annum for five years).

General Regulations

Article 1.—Messrs. A. and E. Michelin have instituted an Aviation Contest called the "Nouvelle Coupe Michelin," for which they are presenting prizes amounting to 100,000 francs.

They have entrusted the drawing up of the regulations for this Cup to the Commission d'Aviation of the Aero Club de France. The regulations will consist of General Regulations and Special Regulations.

The Special Regulations for the year 1922-23 will be published before June 1, and for the other years before March 1. They must be ratified each year by the donors.

Article 2.—The Contest is international. It will be held over French territory.

Article 3.—The winner of the Cup will be the pilot of the machine (aeroplane with engine, Class C) which shall have achieved the best performance in accordance with the Regulations, in the twelve months July 1-June 30.

No pilot may compete unless he is a member of a national federation of the Fédération Aéronautique Internationale.

Article 4.—The winner of the Annual Contest will receive a sum of 20,000 francs and a replica in bronze of the Cup by Moreau-Vauthier.

Article 5.—If the Cup is not won in any one year the sum of 20,000 francs will be divided amongst the outstanding contests.

Special Regulations for 1922-23

Article 1.—The winner of the Cup for the year 1922-23 will be the pilot who, in accordance with the General and Special Regulations, has covered at the greatest commercial speed per hour the course in a closed circuit defined below.

The Cup will, however, only be awarded if the commercial speed over the whole circuit is at least 80 kilometres per hour.

The commercial speed is arrived at by dividing the total length of the course by the time which elapses between the departure of the aircraft from its starting-point and its return to the same point.

Article 2.—The closed circuit, called the "Tour de France," will include fifteen landings, to be made on each of the landing-grounds of the following towns:—

Versailles (Buc, Toussus-le-Noble, Saint-Cyr or Villacoublay), Saint-Inglevert, Valenciennes, Mourmelon, Metz (Frescaty), Strasbourg (Neuhof), Dijon (Longvic), Bourges (Avord), Clermont-Ferrand (Aulnat), Lyon (Bron), Nîmes (Coubessac), Toulouse (Latécoère Aerodrome), Pau (military aerodrome), Bordeaux (Teynac), Angers (Avrillé), Versailles (same aerodrome as for start).

Competitors may start at any one of the aerodromes mentioned, to finish at the same aerodrome, the landings being made in the order given above, or *vice versa*.

The landings will be verified by a log-book which will be forwarded to each competitor on entering. On arriving at a landing-place the competitor must have his log-book signed by an official or by two witnesses of the landing.

Article 3.—The Commission d'Aviation reserves to itself the right to alter the course defined in Article 2 if circumstances render this necessary. Except, however, when there is no alternative, the course may not be altered when it has been properly completed by a competitor.

Article 4.—Intermediate landings, replenishments and repairs are allowed. Changing the machine is not allowed. The crank-case and cylinders of the engine will be sealed or stamped. The fuselage and wings of the machine will also be stamped.

Article 5.—The entry, signed by the pilot, must reach the Commission d'Aviation, Aero Club de France, 35, Rue François, 1er, Paris, not later than 6 p.m. two days before that indicated for the start. Sundays and holidays are not included in this interval. Entries may not be received on Sundays or holidays. The entry must indicate the starting-point selected and the date of starting.

The entry fee, which is not returnable, is 100 francs. The entry is valid for all starts made during four consecutive days, the first of these four days being indicated in the entry. During this period the pilot may make as many starts as he wishes, but they must always be made from the place indicated in the entry.

Offices: THE ROYAL AERO CLUB,

3, CLIFFORD STREET, LONDON, W. 1.

H. E. PERRIN, Secretary.

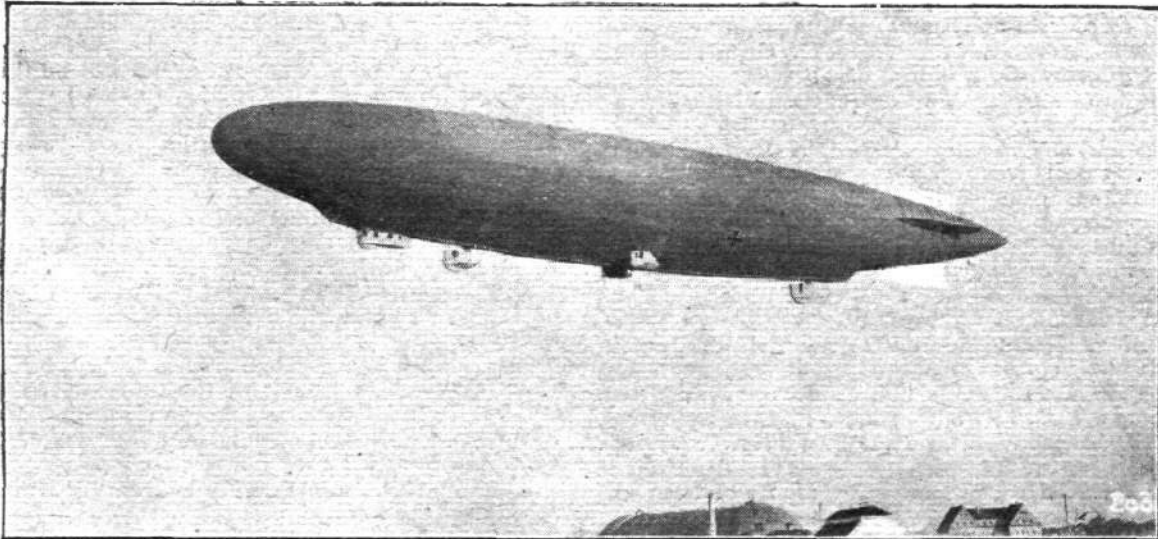
THE 18-TON PARSEVAL SEMI-RIGID AIRSHIP "PL27"

A German Experiment of Promise

ALTHOUGH built as long ago as 1916, there are several reasons why the Parseval type "PL27," designed and built by the *Luftfahrzeug-Gesellschaft* of Bitterfeld, is of sufficient interest to merit a fairly detailed description at the present time. In the first place, the airship was one of the largest semi-rigids ever built, being only very slightly smaller than the ill-fated "Roma," purchased by America from Italy some time ago. Secondly, her design was one representing a considerable departure from previous German non-rigid practice, approaching, in fact, more to the Italian than to previous German types. In spite of the accident to the "Roma," this type of airship is thought by many to have a very considerable future before it, and it is open to discussion whether the world, led

Aeronautical Society that, according to his calculations, six non-rigids, each of 500,000 cubic ft. capacity, could be built for the price of one rigid of 2,000,000 cubic ft. capacity. In other words, with the non-rigid, we should get an extra million cubic ft. capacity for the same money.

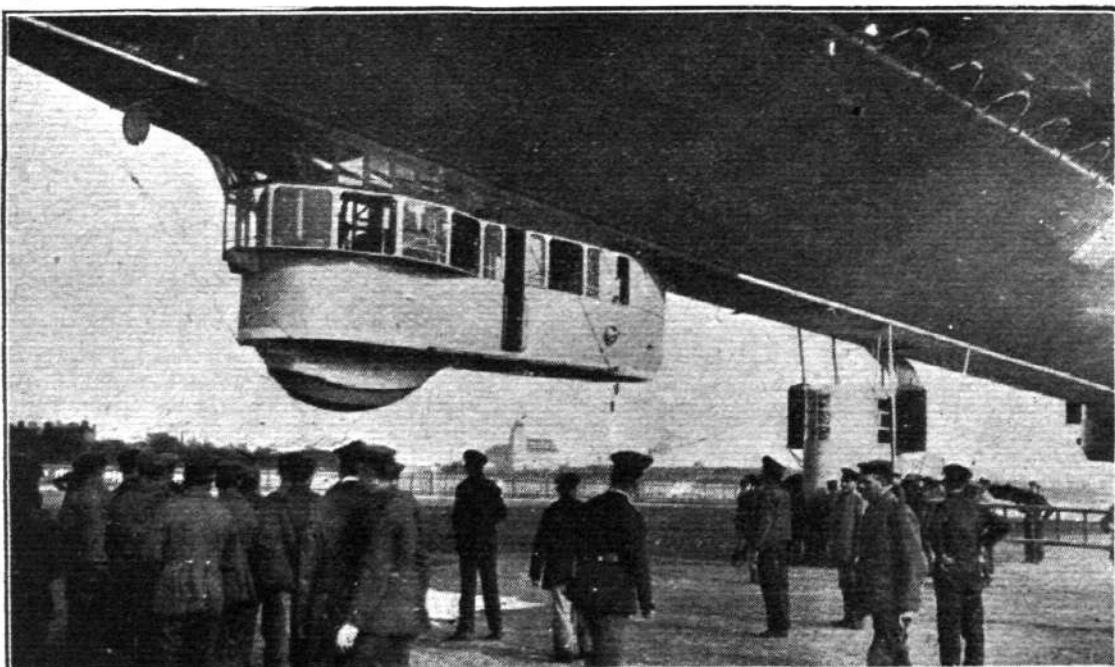
Then there is the question of useful load. Here again Col. Cave-Browne-Cave indicated that a greater percentage of useful lift is obtained in the non-rigid than in the rigid, owing chiefly to the absence of the hull structure. Thus the point where the structure weight is no more than 50 per cent. of the total lift is reached in the non-rigid with the half-million cubic ft. ship, whereas in the rigid it is not attained until one comes to sizes of about two million cubic ft. It



The Parseval "PL27" in Flight.

by Germany, was right in deciding in favour of the rigid type of ship. In Germany at the present time, there is a strong opinion that the limits in non-rigid and semi-rigid airships have in no way been reached, and certainly one could enumerate several advantages which these types possess as against the rigid. One very important item is that of cost, and in this respect the non-rigid, and, to a somewhat smaller extent perhaps, the semi-rigid, compares very favourably indeed with the rigid. The very expensive Duralumin framework is avoided, which at once means a great saving. Col. Cave-Browne-Cave, one of our soundest, and certainly our most persistent and eloquent advocate of the non-rigid airship, stated in one of his admirable lectures before the Royal

would, therefore, appear that we may have been on the wrong track in pinning our faith almost exclusively to the rigid type. With things as they are at present, the question of the purchase, running and upkeep of a rigid is a big item. It is, at least, open to doubt whether we should not be better advised in making a start on airship services with types other than the rigid. As regards safety, there is probably little to choose between the types, and the non-rigid, apart from the advantages already outlined, has another in that, when not in use, it can be deflated and stored away in the corner of a shed. A rigid airship occupies as much space when deflated as it does when inflated. Furthermore, in the case of a forced landing, the non-rigid, and the semi-rigid which has its



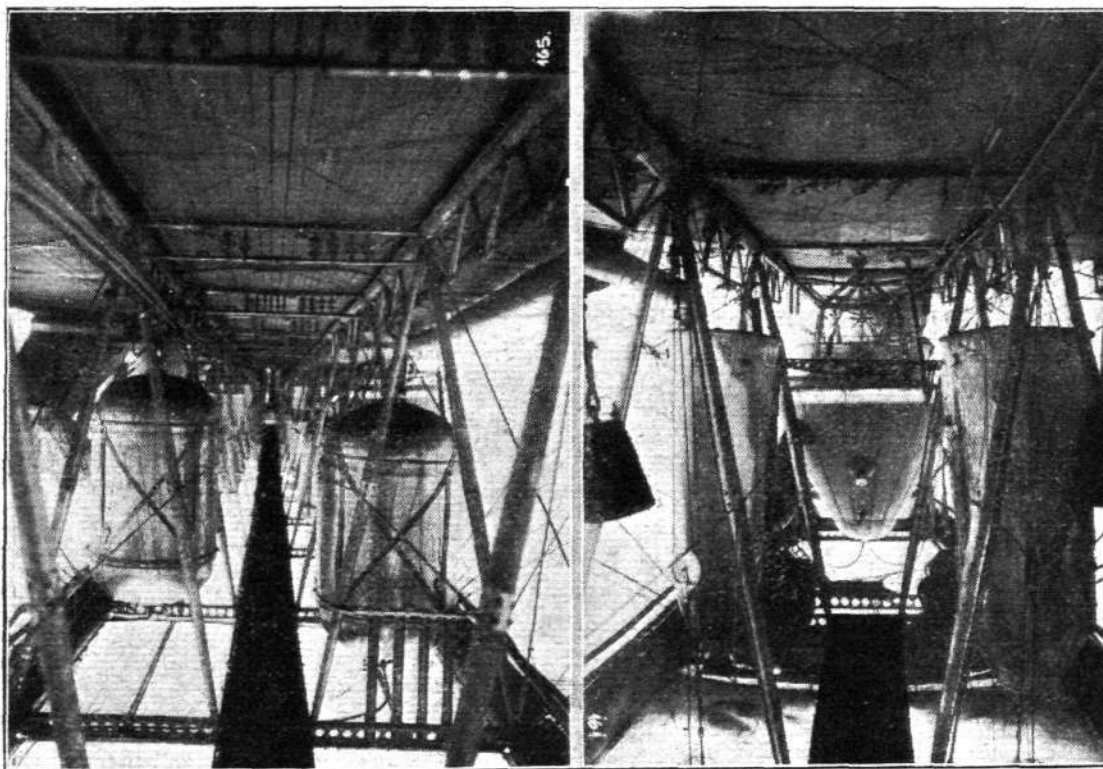
THE PARSEVAL "PL27" : View of the forward portion of the ship, showing the control car, etc. Note the bumping bag under the car.

keel built in sections, can be packed up and sent home. The rigid, if it should be forced down from any cause, would almost certainly have to be written off as a total loss.

There is a great deal more which could be said about non-rigid and semi-rigid airships in general, but sufficient has, we think, been said to indicate that, as it has now been proved that these types need not be restricted to small airships, this class of airship deserves more consideration, from a commercial aviation point of view, than it has received in the past.

The Parseval "PL27" has an overall length of 157 metres

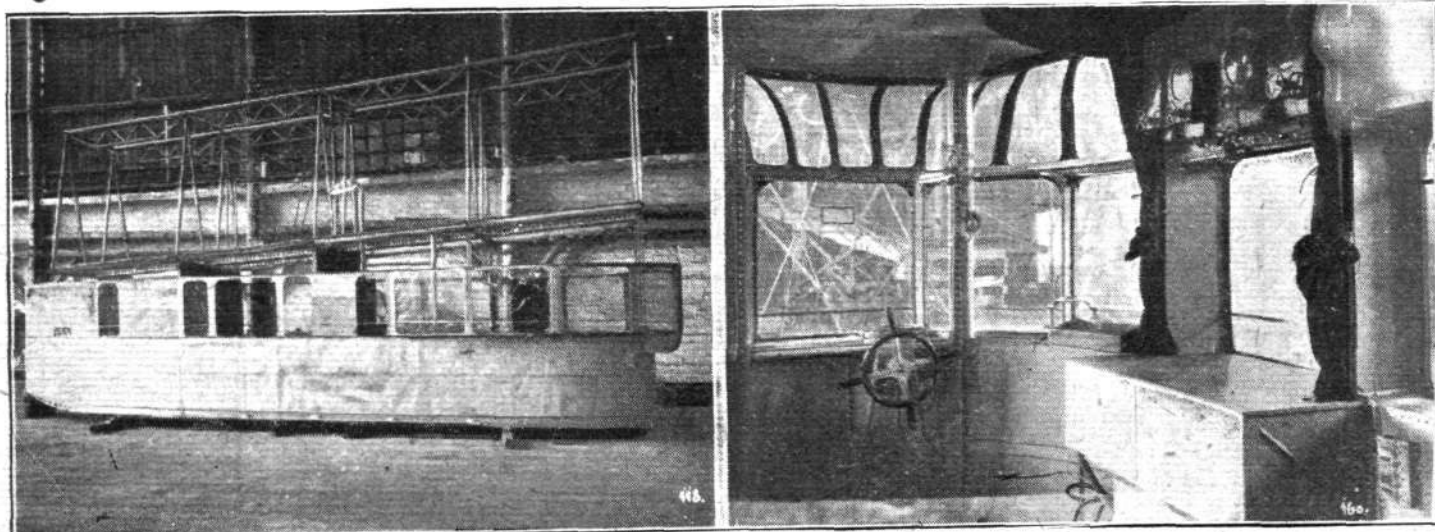
airship was intended. For a very long flight a great proportion of it would be taken up by the fuel. For shorter distances the lift which could be set aside for paying load would increase. If the route on which such a ship was used were to be divided into stages of approximately 1,000 miles each, the "PL27" could carry a crew of seven, sufficient fuel to leave a safe margin, and, in addition, have accommodation for about twenty-five passengers. It will thus be seen that, as regards earning capacity, the "PL27" should be a very useful craft as a passenger and mail ship, especially as her cruising speed is said to be about 60 m.p.h. In our



The Parseval "PL27" : Two views inside the keel. On the left is seen the gangway and petrol tanks ; on the right the water ballast bags. Both photographs were taken before the fabric covering was put on the keel.

(515 ft.), a maximum diameter of 19.6 metres (64 ft. 4 ins.), a greatest circumference of 61.55 metres (202 ft.) and a height of 26.5 metres (87 ft.). Its cubic capacity is 31,300 cubic metres (1,104,000 cubic ft.) and the disposable lift is approximately 18,000 kilograms (nearly 18 tons). Assuming a lift of 65 lbs./1,000 cubic ft. of hydrogen, the total lift would be approximately 32 tons, so that the disposable lift is 56 per cent. of the gross lift, which is considerably better than the figure of 50 per cent. given by Col. Cave-Browne-Cave for a 500,000 cubic ft. ship. The allocation of this 18 tons of lift would, of course, depend upon the purpose for which the

Editorial Comments in the August 25, 1921, issue of *FLIGHT*, we published some figures relating to the cost, etc., of a service run with airships of this type. It was then estimated that these airships could be built in England for not more than £30,000 each, and if built in batches, the cost should be even lower. Thus, by reducing the length of the stages flown to approximately 1,000 miles, a much more economical service should be possible than if large rigid, capable of doing the London-Cairo trip without landing, were employed. In this way, the time for the journey to Australia, for instance, would be somewhat increased, but, on the other hand, it is

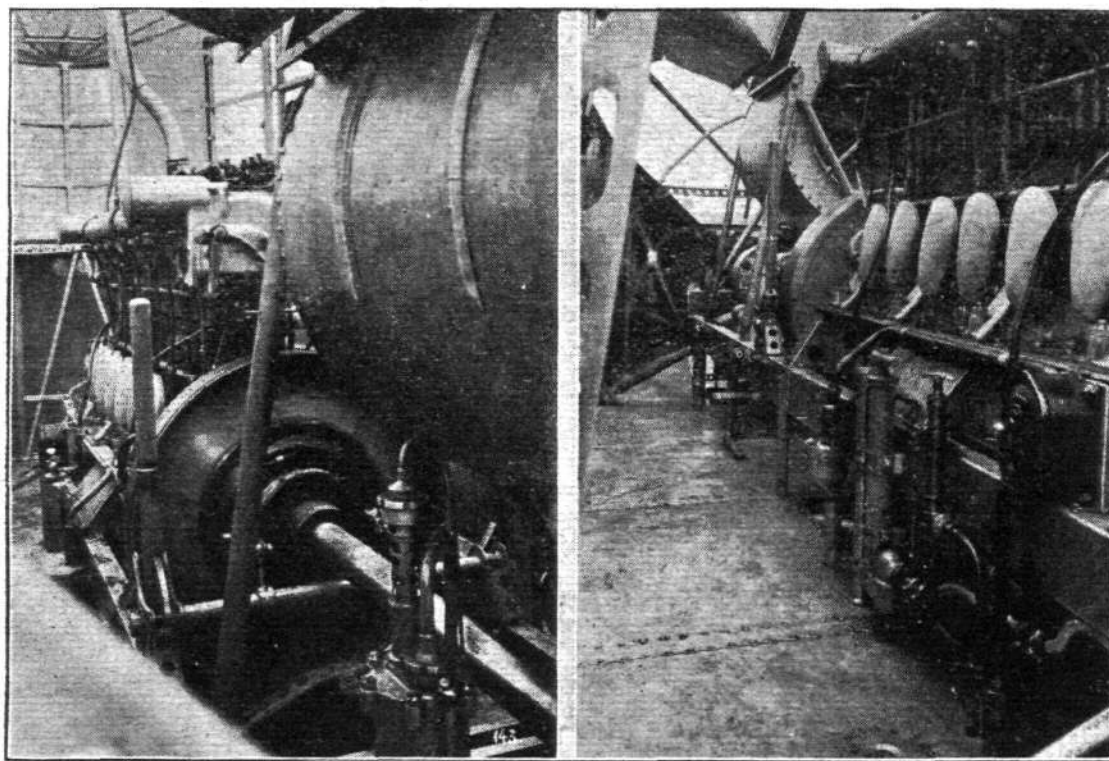


THE PARSEVAL "PL27" : External and internal views of the control car. The left-hand illustration shows a portion of the keel structure above the control car.

at least conceivable that a greater revenue would be forthcoming, as it should be easier to fill up the ships with passengers for shorter distances over portions of the route.

As regards the design and construction of the Parseval "PL27," this ship is, to some extent, based upon the Italian designs in which there is a keel structure running the greater part of the length of the airship, and to which are attached some of the heavier local loads such as petrol and water tanks, central engine cars, etc. This structure is so designed that its parts form, as it were, the links of a chain. In the "PL27" the keel, which is about 330 ft. long, is divided

The latter are of two kinds. One is known as "trouser" (*Hosen*) bags, and are emptied singly by means of a ripping line from the control car. The other kind has valves, and is emptied, also from the control car, two at a time. All the bags are of 200 kilogs. (440 lbs.) capacity. The "trouser" bags are mounted four forward and two aft. The ordinary bags, of which there are thirty-six, are distributed along the keel, the valves of every two bags being connected to one control line, so that with these 880 lbs. of water is discharged at a time. The total amount of water ballast carried is thus 8,400 kilogs. (18,500 lbs.).

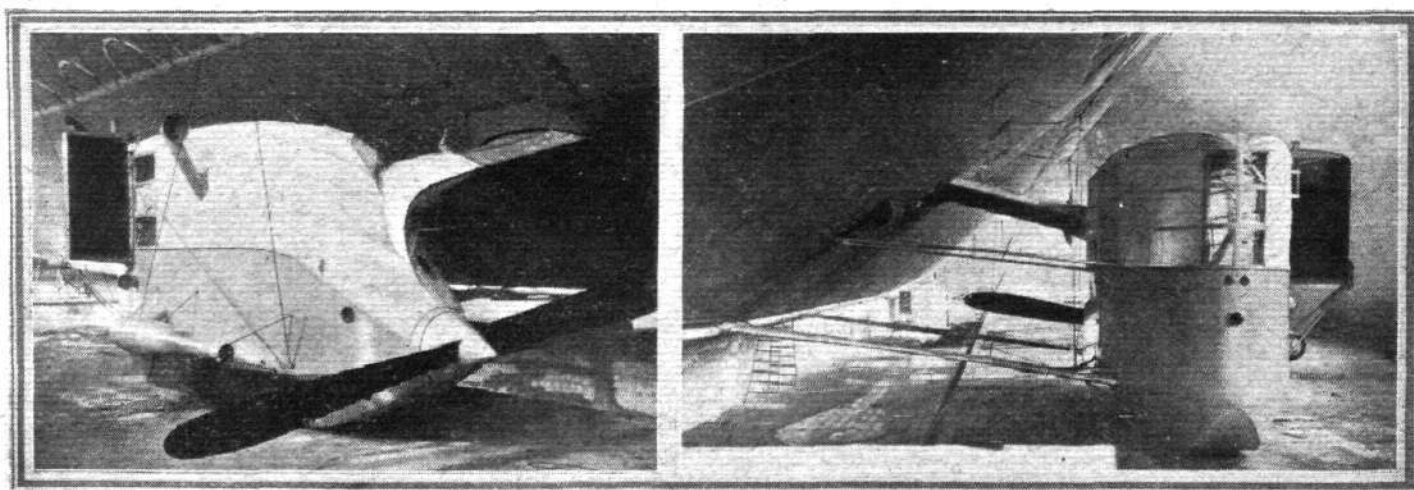


The Parseval "PL27" : Views inside the port engine car. On the left are shown the engine, clutch and air compressor. On the right is a close-up view of the engine and blower.

into fifty-two separate cells or units, the whole being so designed that the keel can resist longitudinal loads, but not bending moments, owing to the manner of joining the cells to each other. The keel is built up of a tubular framework, consisting of four main longitudinals, struts and wire bracing.

Three of the cars, the control car and the front and rear engine cars, are attached direct to the keel, while the two side engine cars are slung by cables from the envelope, and steadied laterally by struts to the keel. The attachment of the keel to the envelope is by rigging wires and fabric. As already mentioned, the keel serves to support, in addition to the three cars, the petrol tanks and water ballast bags.

The petrol tanks are hung in the keel, as shown in one of the accompanying photographs. Normally, thirty petrol tanks are carried, twenty-six main tanks and four gravity tanks, one for each engine. The capacity of each tank is 200 kilogs. (440 lbs.), so that normally the total petrol capacity is 13,200 lbs. (nearly 2,000 gals.). Provision is, however, made for slinging another ten petrol tanks in the keel, bringing the petrol capacity up to 8,000 kilogs. (17,600 lbs., or about 2,500 gals.) if long journeys are contemplated. The lift available for paying load is then, of course, correspondingly decreased. In fact, by the time one had counted in a crew of about ten, with their provisions, there would be little more load available.



THE PARSEVAL "PL27" : Two views of the port engine car. The three-quarter rear view on the left shows the cable suspension and streamlined casing around the petrol leads, etc. In the right-hand photograph can be seen the struts which brace the car to the keel structure.

As regards the placing of the petrol tanks in the keel, they are arranged in three groups, corresponding to the arrangement of the engine cars. The forward group, feeding the front engine, consists of six main tanks and one gravity tank. A similar number and arrangement feed the aft car, while the central group, which supplies the two wing engines, consists of fourteen main and two gravity tanks. All the tanks are arranged for easy slipping in case of emergency.

The arrangement of the cars will be understood from a reference to the accompanying photograph of the airship in flight. The control car is placed right forward. A short distance aft of this is the forward engine car, under the keel of the airship. Approximately half-way along the length of the ship are the two wing engine cars, some distance out from the centre line, and finally near the rear end of the keel is the aft engine car. Each of the engine cars contains one 240 h.p. Maybach engine, driving pusher screws through reduction gearing and clutches. The engines are mounted with their crankshafts about 10 ins. above the floor of the car, and the lower part of the crank-case can be reached by removing a loose floor plate. The transmission includes a reverse, two wheels being in mesh for forward and three for reverse. The reduction is such that, although the engines run at 1,400 r.p.m. at full power, the propellers run at 180 r.p.m. only. Their diameter is 14 ft. 9 ins. A blower, or fan, placed in the stern of the car, is driven at a speed of 1,850 r.p.m., by means of a silent chain, and delivers $2\frac{1}{2}$ cubic metres (88 cubic ft.) of air per sec., at 100 mm. of water. The engine cars have a length of 6 metres (19 ft. 8 ins.), a maximum width of 1.8 metres (5 ft. 11 ins.), and a height of 1.6 metres (5 ft. 3 ins.).

The control car is 9 metres (29 ft. 6 ins.) long, 2 metres wide (6 ft. 7 ins.), and 2 metres high. It is divided into three compartments, of which the forward one is the control cabin, and the aft one the wireless compartment. From the central compartment access to the keel is gained via an automatically closing trap door, and a shaft leads through the hull to a platform on the top of the envelope. In the control cabin the rudder control wheel is placed forward and slightly over towards the starboard side. The elevator control wheel is placed on the port side. The control cabin is, of course, provided with a number of instruments, as well as with the controls for gas and air valves, etc.

The hull or envelope of the "PL27" is made of three-ply fabric, of which the inner and outer layers run longitudinally, while the middle layer is placed at an angle of 45 degrees. The tearing strength of the fabric is stated to be 2,000 kilogs. (4,400 lbs.) per metre width. In addition to this strong fabric, the hull is strengthened by so-called trajectory bands. These are bands of webbing, about 2 ins. wide, stuck to the envelope fabric and covered with water-tight cover strips. The use of these bands constitutes, we believe, a *Luftfahrzeug-Gesellschaft* Patent. The tearing strength of these bands is 1,320 lbs.

The gas space is divided, by three fabric bulkheads, into four compartments, of which the forward and aft have a capacity of 6,260 cubic metres (220,500 cubic ft.) each, while the other two have a capacity of 9,390 cubic metres (331,500 cubic ft.) each. The fabric bulkheads are reinforced with webbing, and are capable of carrying a difference in pressure between their two sides. If, for any reason, it should be

necessary to equalise the pressure in two adjoining gas compartments, this can be accomplished by a hose which is normally kept closed by being tied up, but which can be opened by the crew.

Each gas compartment is provided with an air bag or ballonnet, which when completely filled occupies 52 per cent. of the gas compartment volume. Thus, the capacity of the fore and aft ballonnets is 3,250 cubic metres (115,000 cubic ft.) each, and that of the second and third ballonnets 5,000 cubic metres (176,500 cubic ft.) each. The ballonnets consist of two portions, the lower of which, attached to the envelope, is made from two-ply fabric, of a tearing strength of 1,200 kilogs. per metre width, while the upper part is in a single thickness and has a strength of 900 kilogs. (2,000 lbs.) per metre width.

Each of the gas compartments is provided with two gas valves, placed in shafts and discharging through the top of the envelope. The openings on the top of the envelope are covered with fabric hoods. Each ballonnet has two air valves, built into the keel, and having discharge pipes leading into the open. In addition, each ballonnet has an inlet valve of the flap type, serving to admit air from the fans. The four flap valves communicate with a common pipe or hose, into which all four blowers discharge. Each ballonnet has also a pressure regulator (automatic) which ensures that there is always an excess of pressure of 25 mm. of water. Should the pressure fall to 25 mm., the regulator opens the inlet valve, which communicates with the common pipe from the blowers and keeps it open until the old pressure has been established, when the valve is closed. If the pressure rises to 27 mm., the pressure regulator opens either the air valves of the ballonnet or the gas valves of the gas compartment or both, according to the setting of the switches in the control car. The actual operation of pulling the air or gas valve cords is carried out by the automatic regulator, although when required, as for instance in landing, members of the crew can operate the valves direct, without the action of the regulator.

The tail planes are so attached by struts, etc., that they cannot be pressed into the envelope. They are designed for interchangeability, the fins and tail planes being identical. The elevators are, however, different in shape and size from the rudders.

Altogether, the Parseval "PL27" is a very interesting airship, and it has proved that it is possible to design even quite a large ship without necessitating a change over to rigid construction. It is confidently expected by the *Luftfahrzeug-Gesellschaft* that, if desired, even larger ships can be built on this principle, but even taking the "PL27" as she existed in 1916, the type should have a considerable sphere of usefulness at the present time, and the type has the advantage of having been tried out to the satisfaction of the designers, behaving well during manœuvring, and showing a good turn of speed. It may be expected that when Germany is once more free to develop, without the present restrictions, more will be heard of airships of this type, and we should not be surprised to hear of regular services being established between Berlin and London, which cities are sufficiently far apart to afford a considerable saving in time by travelling by air, and yet not so far as to necessitate the use of rigid airships.

Short Service Commissions in the Royal Air Force

THE Air Ministry announces that vacancies exist for suitable candidates between the ages of 18 and 25 for short-service commissions for flying duties in the Royal Air Force. Applicants are interviewed by a Selection Committee at the Air Ministry, and those selected and found medically fit are gazetted as Pilot Officers (on probation). The probationary period is six months, after which, subject to satisfactory progress, officers are confirmed in rank.

Short-service commissions are granted for four years' service on the active list, which may be extended by one year in the case of officers desirous and recommended. On completion of service on the active list, officers normally pass to the Reserve and receive a gratuity of £75 for each completed year's service: thus, if an officer completes four years and does not extend his service, he would receive a gratuity of £300 on passing to the Reserve.

Officers in the Reserve receive retaining fees and are required to undergo short periods of training each year. For all purposes of pay, allowances and promotion, short-service officers receive equal treatment with officers holding permanent commissions.

All officers entered under this scheme are taught to fly, and facilities are afforded, when possible, to specialise in certain other subjects. Candidates desirous of consideration under this scheme should apply by letter to the Secretary, Air Ministry (S. 7), Kingsway, W.C. 2.

Trans-Atlantic Flight Completed

COMMANDER SACADURA CABRAL and Capt. Cago Coutinho have at last successfully accomplished their flight from Lisbon to Rio Janeiro on the third Fairey (Rolls-Royce) seaplane, having, it will be remembered, started from Lisbon on March 30 last. After arriving at Pernambuco (Brazil) from St. Paul's Rock on June 5, they completed the remainder of the journey in stages along the coast, eventually arriving at Rio at 2.32 p.m. on June 17. They were given an enthusiastic reception on their arrival, being met by Brazilian warships together with a squadron of aeroplanes. Their arrival was the occasion of a general holiday in Rio, when the inhabitants "let themselves go" in true South American style. The last stage of the journey from Victoria, a distance of 280 miles, was accomplished under very bad weather conditions.

NEW BRITISH AIR SERVICE

Marine Aircraft to be Used Between Southampton and France

A SCHEME for the establishment of air services between Southampton and the French ports of Cherbourg and Le Havre has been approved by the Air Ministry. The services will be operated under the general terms of the subsidy scheme made public in June of last year. A new company, probably with the title of the British Marine Air Navigation Co., Ltd., is being formed to operate these new services, and in addition to the promoting company certain shipping companies will be financially interested in the scheme.

These services mark an important stage in the development of commercial aviation, as the company will use, for the first time, marine aircraft, designed and built by the Supermarine Aviation Works, Ltd. The existing British services use land types of aircraft only. The need for establishing services using this type of aircraft was emphasised in 1919 in the Report of the Advisory Committee on Civil Aviation.

The main object of the scheme is to shorten the cross-Atlantic journey by picking up passengers from Cherbourg, conveying them rapidly by air to Southampton and thence onwards to London by train. In addition, the company intend to operate a service between Southampton-Le Havre in order to speed up travel on the cross-Channel section

between London and Paris for passengers proceeding by this route.

In both these schemes the company has the active co-operation of the London and South-Western Railway Company in connection with through bookings between the terminal points on each route. Subsequently it is proposed to operate a service between England and the Channel Islands for passengers, produce, newspapers and mails. This air service will also reduce very greatly the time taken between the islands and the mainland.

The company will receive a subsidy of 25 per cent. on the gross earnings from the carriage of passengers, goods and mails, and also a payment of £1 10s. per passenger carried and 1½d. per lb. of goods carried. The latter payments are half the sums paid to approved companies operating the London-Paris air services. In other respects the company will receive assistance similar to that at present provided to other approved companies.

The French authorities have been approached for the provision of the necessary customs facilities at their ports, and the French railway companies concerned are also assisting by providing suitable train connections on their part of the through route to Paris.

NOTICES TO AIRMEN

Holland : Emergency Landing Grounds

It is notified that additional emergency landing grounds have been established at: (a) *Bussum*, (b) *Rijssen*, and (c) *Hellevoetsluis*.

(Details are given in Notice No. 56 of 1922.)

Italy : Regulations Governing Flight of Foreign Aircraft

1. PILOTS of aircraft making an isolated flight over Italian territory are required to observe the following rules:—

(a) *Notice to Italian Authorities*.—Previous notice of the intended flight must be given to the following authorities. As far as possible this should be accompanied by an itinerary of the route to be followed:—

(i) The Ministry of War, High Command for Aeronautics (Regio Ministero della Guerra, Comando Superiore di Aeronautica), Rome.

(ii) The Ministry of Finance (Regio Ministero delle Finanze), Rome.

(iii) The Commandants of the aerodromes at which it is intended to land (Comando del Campo)

(b) *Aerial Corridors*.—The Alpine frontier of Italy may only be crossed at the following passes:—(1) *Ventimiglia*; (2) *Mont Cenis*; (3) *Iselle (Simplon)*; (4) *Chiasso* (between Lakes Lugano and Como); (5) *Brennero* (30 km. S. of Innsbruck); (6) *Tricorno* (23 km. N.N.W. of Tolmino); and (7) *Nauport* (45 km. N.E. of Trieste).

Along the whole of the Alpine frontier zone, aircraft must maintain a height of 2,000 metres (6,500 ft. approx.) above the ground.

(c) *Photographic Apparatus, &c.*—No photographic or cinematographic apparatus, or carrier pigeons, may be carried in foreign aircraft flying over Italian territory.

(d) *General Regulations*.—Foreign aircraft must comply with all laws and regulations in force in Italy.

2. CANCELLATION.—Notice to Airmen No. 33 of 1920 is hereby cancelled.

(No. 57 of 1922.)

NOTICE TO GROUND ENGINEERS

Repair or Overhaul of Licensed Aircraft : Approval of Materials

1. GROUND Engineers licensed in categories "B" and "D" are reminded that, before they can certify as airworthy aircraft and/or aero-engines that have been repaired or overhauled, they must have evidence that all materials used in such repair or overhaul have been proved by test, at an approved test house, to comply with all the requirements of the appropriate specification.

2. Similar proof that the material is correct is essential for spares or fittings purchased and built into aircraft or aero engines, and, should the spares be of such a nature that a complete inspection is impossible on the finished part, the Ground Engineer should ascertain that the manufacturing process or internal workmanship, which cannot be seen in the finished article, has been satisfactorily carried out.

3. Many manufacturers of aircraft materials and spare parts are able to issue certificates with regard to material, process inspection and/or workmanship.

4. Where such certificates cannot be obtained, the Ground Engineer must make other suitable arrangements to prove the condition of the material.

5. Ground Engineers licensed only in categories "A" and "C" are reminded that they are not empowered to certify repairs or overhauls.

(No. 7 of 1922.)

CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

SOARING FLIGHT

[2058] May I take the liberty of bringing to your notice a theory of mine re soaring flight which has received the approval of several aeronautical experts, viz. :—

That soaring flight is caused by the eddies acting on the loose feathers and ridges on the concave surface of a bird's wing and on the ridges of the concave surface of the wings of flying fishes, etc.

Assuming a wind of 20 m.p.h. the eddies under the wing would revolve at about the same speed. These eddies acting on the rough surface and ridges would exert strong propelling effect—in fact would be much stronger than the drift caused by the wind passing over the smooth, streamlined body and convex surface of the wings; headway could therefore be made in the face of a strong breeze, the camber of the wing enabling the bird to maintain its altitude.

F. J. CHIVERTON

Southampton.

Sir Ross Smith and Lieut. Bennett laid to rest in Australia

THE funeral of Sir Ross Smith, which took place at Adelaide last Thursday, was an extremely impressive one. The business of the city was suspended for the occasion, and thousands of people turned out to pay a last tribute to the hero of that wonderful London-Australia flight. The official service was held at St. Peter's Cathedral, conducted by Dean Young, ex-Chaplain Bickersteth, M.C., delivering an eloquent address. The mourners included the father and mother of Sir Ross, his brother Sir Keith, and representatives of the Australian Government. The funeral procession extended for about two miles in length, and during its progress to the cemetery draped aeroplanes hovered overhead.

Lieut. Bennett, whose name is so closely coupled with that of Sir Ross Smith, was buried at Melbourne on Saturday. The funeral ceremony was likewise most impressive, and was very largely attended. Amongst the mourners was Sir Keith Smith. In the course of his address, Mr. Hughes said that the names of Ross and Bennett would always be held in reverence by Australians, and remarked upon the pathetic fact that after such a magnificent achievement two members of the party met with disaster while carrying out what appeared to be such a small task.

LONDON TERMINAL AERODROME

Monday Evening, June 19, 1922.

THERE was a welcome improvement in the number of passengers travelling on the "airways" on Friday and Saturday last. Handley Page Transport, in particular, had good loads on both days: in fact it was quite cheering to see the cars arrive and depart full of passengers.

The Instone Air Line appear to be suffering from an epidemic of forced-landings. As I have mentioned several times in these pages, there appears to be a cycle of periods in which forced-landings become numerous; and the peculiar part of the whole business is that during any one period they are confined to one particular line. At the present time the Instone Air Line are the unfortunates, their last forced-landing occurring at Lympe on Friday, when one of their D.H.18's had to descend there with something wrong with the oil supply. Mechanics were immediately dispatched from Croydon in one of the firm's "Westlands" to effect the necessary repairs.

Rumours of a Big Amalgamation

ONE hears, now, that there is a scheme on foot for amalgamating the three British companies; but, up to the present, this project is said to have met with but little success.

It is now well recognised, however, that there is not sufficient traffic on the London-Paris service to warrant the existence of three British services, in addition to the two French concerns; and I am given to understand that the British companies are now turning their attention to routes other than London and Paris or London and Brussels.

Messrs. Rowan et Cie., who run the aerodrome general store, are now adding an open-air café to their shop, where they intend serving soft drinks and ices during the hot weather. This café is to be roofed over, and will thus provide a shelter for visitors to the public enclosure in case of rain.

The temporary hangars that were erected last year near the permanent hangars on the workshops' side of Plough Lane have become extremely weather-beaten, and two of them have had the canvas fabric on the roofs torn off. These are now being re-covered, and will provide additional accommodation for the machines which, in spite of the poor traffic, are overflowing from the sheds and new hangars.

The K.L.M. were to have started their 6 a.m. service from London to Amsterdam on Wednesday, but, owing to the inclement weather, this did not get away until after 10 a.m., while on Thursday it had to be cancelled altogether. Since then, however, it has been running with the usual K.L.M. regularity and punctuality. The load for this machine is between 700 and 800 pounds each morning, which is approximately three-quarter-load.

Spraying Fruit Trees from the Air

DAIMLER AIRWAYS had a novel enquiry during the week, when a big fruit-farmer in Kent asked them to provide an aeroplane to sprinkle powder from the air on 50 acres of fruit-trees that were over-run with caterpillars. They enlisted the aid of the De Havilland Aircraft Company, and one of this company's D.H.9's duly carried out the operation. The machine first landed in a large field on the farm and took on board half-a-ton of powder, and then, flying at a

height of about 15 to 20 yards, distributed this over the fruit-trees. The experiment was a complete success, and I understand that other farmers in the neighbourhood are already enquiring the cost of similarly treating their fruit-trees and crops. It is stated, in fact, that, considering the short time the aeroplane takes to do the job—the 50 acres in question was sprayed in half-an-hour—it is actually cheaper and much more effective than by any other method.

The daily newspapers have at last got hold of the theory of the cause of the accident to the "Spad" which fell into the Channel on June 3. This theory, one may mention, has been causing much comment on the aerodrome for the past ten days. It is confidently affirmed in certain quarters on the 'drome—and in fact the opinion is so strong I understand the accidents' branch of the Air Ministry are investigating it—that the pilot of the ill-fated "Spad," M. Morin, was attacked in mid-air by one of his passengers, and thus lost control of his machine, which dived into the Channel. Incidentally, it has now become the rule on the "airways" that, in machines with accommodation for an extra person in the pilot's cockpit, on no account shall a passenger occupy this seat. Furthermore, in order to guard against failure on the part of the pilot, the Daimler Airways have now decided to carry two pilots on each machine.

Control of Traffic on the 'Drome

As a result of the conference held between pilots and Air Ministry officials with regard to the regulations governing the arrival and departure of machines from the aerodrome, one of the C.A.T.O. ground staff now stands on the tarmac and waves a flag as a signal that a machine may take off. This, however, has caused so much misunderstanding, and at times delay, that some of the pilots are now rather wishing that the new rules had not been drawn up at all.

Apropos my remark last week that the night-flying "Goliath" was the only foreign "air express" using Croydon that is fitted with wireless, M. Didier informs me that the Messageries Aériennes now have four of their "Goliaths" so fitted, and that as each Goliath comes from the factory it is being equipped with wireless before being put on the service.

The various air lines are now making arrangements to try and attract more business to the air by offering excursion facilities on special occasions. The Handley Page Transport are running a one-day excursion to the Grand Prix in connection with which the Lep-Aerial Travel Bureau are issuing inclusive return tickets covering the cost of lunch and the entrance to the Grand Stand on the race-course. Messageries Aériennes are now running regular excursions each week-end to Le Touquet at an inclusive return fare of £7 7s.

Capt. Muir was doing further parachute tests during the week. He tells me that the two Greek inventors whose parachute he is testing have succeeded in making a parachute with ordinary material, costing only 8d. a yard, that is perfectly safe and strong, in addition to being light enough for air work. I understand that they will now, as a result of these experiments, build a parachute of silk that will be an improvement, both as to cost and weight, on anything yet produced.

S.B.A.C. Chairman and Officers

MR. C. R. FAIREY, M.B.E. (Chairman of the Fairey Aviation Co., Ltd.), has been elected Chairman of the Society of British Aircraft Constructors for the year 1922-23. Capt. P. D. Acland (Vickers, Ltd.) has been elected Vice-Chairman and Sqdn.-Comdr. James Bird (Supermarine Aviation Works, Ltd.) Hon. Treasurer.

Sir Henry White-Smith, C.B.E., the retiring Chairman, who has been Chairman of the Society since its formation in 1916, becomes Past-Chairman.

Twenty-Nine Days versus Eight Days by Air

THE Postmaster-General states that the air mail for Baghdad which was dispatched from London on May 18 reached Baghdad on May 26. This was a particularly notable achievement, as the normal time occupied in transmission by the combined ordinary and air route is between 11 and 18 days, and by ordinary route all the way it is about 29 days.

Note that the next air mail to Baghdad will be dispatched from London on Thursday, June 15.

A New French Flying Boat

ON June 10 the first of the new three-engined flying boats intended for the service between Antibes and Ajaccio (Corsica) arrived at the air-port of Antibes. This machine, registered as "L.E.O.6," made the journey from Saint-Raphael, about 25 miles, in 22 minutes, in spite of very unfavourable weather, the pilot being M. Martin.

The machine loaded weighs 8,800 lbs. The central motor is a Salmson 260 h.p., and the other two are Hispano-Suizas of 150 h.p. each, or a total horse-power of 560. The pilot is housed in a small separate compartment by himself with the necessary instruments and wireless outfit, and below him is a spacious cabin seating six passengers. At two-thirds of its full power the speed is said to be 90 m.p.h.

The flying boat, which has been built by Les Etablissements Lioré-Olivier for the Cie. Aéro-Navale, which has the concession for the service between Antibes-Ajaccio-Tunis, was designed largely by M. la Barthe, a director of that line, and after thorough trials will commence its duties between the Riviera and Corsica, where the air traffic is already reaching considerable proportions.

THE INDEPENDENT AIR FORCE DINNER

Fourth Annual Reunion

ON Monday, June 19, about 90 members of the I.A.F. and guests gathered at the Hotel Cecil for the Fourth Annual Reunion, under the chairmanship of Air Chief Marshal Sir Hugh Trenchard. Group Capt. H.R.H. The Duke of York, a member of the Force, was present, and the guest of honour was the much beloved and great French officer, Genl. de Castelnau. Other guests present were Capt. the Rt. Hon. J. E. Guest, Secretary of State for Air; the Rt. Hon. Winston Churchill, late Secretary of State for Air; Capt. M. Sablé, French Air Attaché; Capt. de la Ferrière; le Marquis de Bonardi; Capt. de Kerrillis; Maj.-Gen. J. E. Dickie, C.B.; Group Capt. C. L. N. Newall, C.M.G., etc.; Col. Sir Walter Lawrence, Bart., G.C.I.E., etc.; Gen. Whittington, C.M.G., etc.

Capt. Guest, in proposing the health of Gen. de Castelnau said, before giving the toast, he proposed to say a few words about the Service and the development of flying generally in this country. During the last year, he said, the independence of the Ministry and the Force had become greatly and firmly consolidated. Every day new responsibilities were being placed upon them, and bravely shouldered by their remarkable and indefatigable Air Chief Marshal. He took that opportunity of offering the sincerest congratulations upon his well-merited promotion from Air Marshal to Air Chief Marshal. The filling of that post for the first time in the Air Force gave the Chief of the Air Staff the equivalent rank of full General or Admiral.

The Air Force was gaining great credit and earning fresh laurels by its performances in India, Aden, Somaliland, Egypt, Irak and Palestine, and from all quarters reports arrived which showed how high were both the morale and the efficiency of the squadrons overseas.

Continuing, Capt. Guest said it was being gradually appreciated by the public that the Air front had now no relation whatever to either the Sea front or the Land front, where we had been accustomed to expect collisions to occur. The Air Arm was now being gradually recognised as the first line of defence.

Home defence against air attack was the Air Ministry's latest responsibility, and it was from that point of view that the study and development of Civil Aviation became of vital consequence. It had been suggested that Civil Aviation should be analogous to the Merchant Service, but a moment's study would show that this could never be so until civil air transport became a commercial success. The Merchant Service of England was not built up on subsidies, or high insurance rates, nor yet to provide reserves for the Navy. Even in its infancy, a few payments for services rendered, such as the carrying of mails, were the only assistance that the great merchant and passenger sea services of Great Britain ever received. The Government paid—and pays—for the use of these great transport services just as anyone else does—no more and no less. It would, he said, be fatal if we permanently departed from the great principle that Civil Aviation, to be of any real national value, must, sooner or later, be able to fly by itself. The interim period between the "sooner or later" was, however, the one with which they were concerned at the present time, and the Government policy of giving temporary assistance to this undertaking during its infancy was only justified up to a certain point.

Capt. Guest having summarised the terms of the present subsidy granted by Parliament, said he was informed that none of the companies pay, and it was suggested by some that this failure to pay was due to competition, and that the problem would be solved by granting a monopoly. Again, this suggestion clashed with the fundamental view of British trade development. Every successful industry had been built up by healthy competition, and if Civil Aviation was ever to pay in this country, it must be on the basis of reasonable and healthy competition.

The first responsibility of the Government was to safeguard the public from avoidable risks (a) by guaranteeing the airworthiness of aircraft, (b) by the careful licensing of pilots and ground engineers, and (c) by satisfying themselves of the efficiency of a company before allowing it to operate.

The deductions to be drawn from these considerations, even if a little depressing, had better be bravely stated.

1. The rapidity and perfection of rail transport in our small island made this country the most unlikely of any in Europe for Civil Aviation to succeed as a commercial enterprise.

2. Our fitful climate was a still further handicap.

The British Empire, however, was not confined to the British Isles, and we had within our boundaries and Dominions more wide stretches of territory, unbridgeable except

by air, than any other nation in the world. He was satisfied that Civil Aviation could be made a commercial success and Imperial asset by the development of these further routes.

Canada, India, Australasia, South Africa, all, in his opinion, offered fruitful ground for this development, and he seriously recommended British enterprise to study and develop these wider fields. It was not impossible that by the development of these Imperial routes we might be able to collect an Imperial reserve of trained pilots.

He was, however, all for the maintenance and development—even, if necessary, by higher subsidies—of the cross-Channel route, if only from the point of view of experience and illustration. It must be realised that these services were undertaken in the fiercest limelight of criticism and in the face of the most intensive land and sea competition, and he submitted with a very high degree of efficiency and success.

Capt. Guest then made an appeal for the general Press to modify their attitude with regard to the exaggeration of accidents.

Gen. de Castelnau, replying to the toast, said his first thought was to associate himself with all his heart to the respectful toast to His Majesty The King. He did so in obedience to the respectful and unalterable feelings of devotion which they had harboured in France for so long towards the glorious dynasty which directed the destiny of the British Empire. Gen. de Castelnau went on: "I want to thank Air Marshal Trenchard for having allowed me to meet you all, my dear comrades of the British Army, whose glory is inseparable from all memories of the Great War. To thank you I should like to possess a voice of gold, but my voice, alas! is made of a coarser metal of disused war weapons. I am happy for England, our neighbour and friend, and happy for my country to see assembled here so brilliant a company of heroic aviators. I am happy to see them under the auspices of the Duke of York, under the sagacious direction of Capt. Guest, Minister of the Air, and under the command of Air-Marshal Trenchard."

Air Chief Marshal Sir Hugh Trenchard, in proposing the Independent Force, said he would like to take the opportunity of saying how keen were all of them who were there that night, His Royal Highness included, that this dinner club should continue and prosper and that more and more of their members should be present year by year; and of mentioning the untiring efforts of Maj. Toc Smith, Sqdn-Ldr. Cleverly and Group-Capt. Newall to make their dinner a success.

He was glad to say that since they last met the discussions of the past were happily over. The Service was now made, and they had helped to make it. Small though it still was, it had its charter. They thanked Lord Cavan and the Army Council for the help they had given and were giving them, and that he knew they would continue to give them; and though they were still discussing with the Admiralty improvement in methods of co-operation with the Navy, he felt quite certain that they could rely on their help also.

In the past twelve months they had been by no means idle. They had been successful in maintaining peace in Trans-Jordan. Responsibility for Iraq was in process of transfer to them, and all accounts from all sources told wonderful things of the Air Force in that country. They heard how efficiently they were carrying out their work under great climatic and other difficulties, and how the Air Force had already saved large sums of the long-suffering tax-payers' money. The cross-desert route, without any organisation and practically without any money spent upon it, and in spite of all difficulties of landing in the desert, had carried the mail with a saving of an average of 10 to 14 days over the ordinary route ever since it was opened on August 1 last.

At Aden they had only three machines. The reports he had received were extraordinarily good. They had done a great amount of work, and had, he thought, incidentally prevented a renewal of disturbances in Somaliland.

Referring to the Pageant, Sir Hugh said what he wanted to impress upon them was that the Pageant was really the culmination of their training. Their training aimed primarily and chiefly at reliability and organisation. The organisation enabled every machine to start for every event within a minute of scheduled time, and that, he thought, was something to be justly proud of. It was a military asset, a military necessity—and it was done. Not only was it done at the Pageant. Recently they had occasion to move a squadron, with all its personnel and transport and everything complete.

They gave the order to uproot them from their peace station on a Wednesday evening, and by Saturday evening the whole squadron of 12 machines, personnel and everything had landed satisfactorily at their new station.

With regard to what had been done afloat it was rather harder to particularise, but they had not lagged behind afloat any more than they had on land. In fleet exercises also their aircraft were playing an increasingly important part. Deck landings had proved successful, torpedo work was becoming increasingly useful, and all this work afloat required the greatest efficiency in training.

From all sources he heard good accounts of the first lot of cadets that had left the Air College at Cranwell. The Staff College at Andover was now a going concern. He was there the other day, and he could say that he had seldom met a more brilliant set of keen young officers, all of them anxious to improve themselves for the benefit of the Air Service and to investigate every possibility of the air. The boys being trained at Halton and Cranwell were gaining a great reputation, and he did not doubt they would go on doing so. So far it was all praise, but there were many difficulties ahead; but whatever might be the controversies of the future, at any rate the Air Force had been formed. It was very small, certainly, but certainly it was very efficient. There were many mistakes that must be corrected, but the foundations were there, and it was for their successors one day to say whether they had been well and truly laid.

In conclusion, Sir Hugh said how proud they all were that General de Castelnau, Capitaine La Ferriere and Capitaine de Kerillis were present there. With regard to H.R.H. the Duke of York, he was not going to say anything about him. He was not there as a guest. He was a member of the Independent Force, and he was there as one of them. He thanked General de Castelnau and all his French colleagues for the great help they gave them in France. "May the happy *entente* that he established between the British and French Air Services continue for ever," was his heartfelt wish.

Sir Walter Lawrence in happy terms proposed "The Guests," and gave a few highly appreciated reminiscences.

Mr. Winston Churchill, responding, remarked that it was in very stern and hazardous circumstances that the Independent Air Force was born, and no one, except perhaps Sir Hugh Trenchard, could possibly have foreseen the result

that would have been obtained in so short a time in the German Rhine cities. "If the Independent Air Force has been worthy of its commander," said Mr. Churchill, "the commander has been worthy of the Independent Air Force. Fine as is the reputation of the Independent Air Force, it is a great honour that General de Castelnau should come among us to-night." There was no period during the war comparable to the Marne. Upon a narrow balance an immense decision turned. No factor was too small not to be brought into the general addition of that vast calculation. But what would have been the value of that great victory had it not been for the efforts of General de Castelnau? No one had struck a greater blow for France and for the dignity and honour of his country than General de Castelnau.

A very delightful evening was concluded with thanks to the Chairman, which was accorded with musical honours in no uncertain strain, with a couple of "finals" for Lady Trenchard and Hugh Minor.

Those present at the Reunion included: Lieut.-Cols. E. B. Gordon, C.M.G., D.S.O., F. H. L. Errington, C.B., V.D., R. C. Donaldson-Hudson, D.S.O., J. Waley-Cohen, C.M.G., D.S.O., the Hon. Victor Russell, R. H. Collier, D.S.O.

Wing Commanders Louis Grieg, M.V.O., J. H. A. Landon, D.S.O., O.B.E., J. E. A. Baldwin, D.S.O., O.B.E., H. R. Nicholl, O.B.E., L. A. Pattinson, D.S.O., M.C., D.F.C., C. E. H. Rathborne, D.S.O., A. Vere Bettington, C.M.G.

Majors E. K. Brown, H. H. Smith, T. Vincent Smith, M.C., F. M. Iredale, S. A. Chambers, C. H. Nathan, Louis Reynolds.

Squadron-Leaders S. M. Cleverly, C. G. Burge, O.B.E., J. C. Quinell, D.F.C., John Sowrey, A.F.C., H. Gardiner-Hill, A. F. A. Hooper, O.B.E., W. R. Read, M.C., D.F.C., A.F.C., W. J. Ryan, C.B.E.

Flight-Lieuts. W. E. Reason, Alec Gray, M.C., C. R. Cox, A.F.C., C. B. Dick-Cleland, C. A. Stevens, R. C. Savery, D.F.C., A. N. Bengue, R. Halley, D.F.C., A.F.C.

Captains T. B. Marson, M.B.E., A. S. Keep, D. Brunt, L. C. Bygrave, H. L. Robertson, W. A. Herbert, J. E. Hume, D.S.O., E. B. Rayner, F. J. Terrell, E. D. Harding, Wm. Smith, A. G. Trussell, D.S.M., A. H. Fynn.

Flying Officers T. A. G. Hawley, R. S. Martin, E. J. McLoughlin, J. R. Bell, D.F.C., Jack Cottle, M.B.E., D.F.C., John Mitchell, D.S.O., D.F.C., W. Wild, M. Burbidge, R. Stanley-Smith.

Messrs. C. G. Grey, Stanley Spooner, C. C. Turner, E. F. Van-der-Riet.

THE LONDON-CONTINENTAL SERVICES

FLIGHTS BETWEEN JUNE 11 AND JUNE 17, INCLUSIVE

Route†	No. of flights*	No. of passengers	No. of flights carrying		No. of journeys completed†	Average flying time	Fastest time made by	Type and (in brackets) Number of each type flying
			Mails	Goods				
Croydon-Paris ...	40	96	16	27	38	h. m. 2 30	D.H. 34 G-EBBT (1h. 57m.)	B. (5), D.H. 18 (2), D.H. 34 (2), G. (6), H.P. W.8B (3), Sp. (1), V. (1), W. (1).
Paris-Croydon ...	40	91	8	26	35	2 54	D.H. 34 G-EBBS (2h. 23m.)	B. (4), D.H. 18 (2), D.H. 34 (2), G. (6), H.P. W.8B (3), Sp. (1), V. (1), W. (1).
Croydon-Brussels ...	6	15	5	5	6	2 27	D.H. 34 G-EBBT (2h. 5m.)	D.H. 34 (1), V. (1).
Brussels-Croydon ...	5	6	—	5	5	2 34	D.H. 34 G-EBBT (2h. 26m.)	D.H. 34 (1), V. (1).
Croydon-Rotterdam-Amsterdam.	10	8	9	9	10	2 46	Fokker H-NABI (2h. 16m.)§	F. (9).
Amsterdam-Rotterdam-Croydon.	11	7	9	9	11	2 50	Fokker H-NABI (2h. 34m.)§	F. (8).
Totals for week ...	112	223	47	81	105			

* Not including "private" flights.

† Including certain journeys when stops were made *en route*.

‡ Including certain diverted journeys.

§ Rotterdam.

Av. = Avro. B. = Breguet. Br. = Bristol. Bt. = B.A.T. D.H.4 = De Havilland 4, D.H.9 (etc.).
F. = Fokker. Fa. = Farman F.50. G. = Goliath Farman. H.P. = Handley Page. M. = Martinsyde. N. = Nieuport.
P. = Potez. R. = Rumpler. Sa. = Salmson. Sp. = Spad. V. = Vickers Vimy, Vulcan, etc. W. = Westland.

Incidental Flying.—During the week Capts. Muir and Stocken made several test flights on Aircraft Disposal D.H. 9's, and Mr. Hayns took an Avro over to Brussels on the 17th.

SOME ASPECTS OF AERONAUTICAL RESEARCH

BY COLONEL A. OGILVIE

THE Tenth Wilbur Wright lecture was read before the Royal Aeronautical Society by Col. Ogilvie on June 15. It had originally been intended that this year's lecture should have been prepared and read by an American, but at the last moment the arrangements made fell through and the task of giving the lecture very fittingly fell to Col. Ogilvie, who, it will be remembered, was closely associated with the Wright brothers in the early days.

The first part of Col. Ogilvie's paper was devoted to a brief account of the lecturer's first meeting with Wilbur Wright at Le Mans in December, 1908, and the lecturer then proceeded to the main points which he wanted to bring out in his paper. These were, he said, that the Wright brothers based the whole of their knowledge on solid foundations, and that if they had not done so it would not have been possible for them to have overcome the difficulties which they encountered. Col. Ogilvie said it appeared to him that there was some danger of the real lessons of the past not having been understood and taken to heart, and he therefore said he would take leave to conduct his audience over some old ground in order that they might see if there was not some thing there which would help us in laying our plans for the future.

By way of illustrating how thorough must have been the brothers' grasp of fundamental principles, the lecturer gave particulars of the standard Wright machine and the small racing machine produced to compete in the Gordon-Bennett Cup in 1910. The new machine represented a radical departure, being very much smaller and having a more powerful engine. Whereas the wing loading of the standard machine was 2½ lbs. per sq. ft., the loading of the racer had been increased to 6 lbs. per sq. ft. When the racer was first flown by Orville it came up to its designed performance and was in perfect balance and control, and the lecturer thought it doubtful if any aeronautical designer of the present day could make so immediate a success of so radical a departure.

Col. Ogilvie then proceeded to give a brief history of the experimental work of the brothers from 1900 and onwards. A number of problems had to be solved and many technical difficulties had to be overcome, and the first machines could only be controlled with extreme difficulty. The 1901 machine insisted on either climbing steeply or diving, and the trouble was eventually traced to the big camber of the main planes. After this had been cured by substituting flatter wings, some good glides were obtained. But there were other problems constantly presenting themselves, particularly in connection with certain inexplicable happenings in the lateral control, and the further the Wright brothers went, the more, they discovered, there seemed to remain still to be done. It is therefore small wonder that at times they became discouraged. Fortunately, however, they were so deeply interested that they could not make up their mind to drop the subject, and they had the courage to commit themselves to a lengthy programme of laboratory research on the characteristics of aerofoils. This, the lecturer said, was the real starting-point of their ultimate success. The Wright brothers had constructed a 16-in. wind channel in which they tested a great number of small metal aerofoils. The lecturer stated that, to the best of his recollection, the models were about 6 ins. span and 2 ins. chord. That the wind-channel work carried out was satisfactory and accurate was proved, the lecturer said, by the fact that full-scale design based on the work was in accordance with expectation. He said he had been given hundreds of aerodynamical figures of all kinds by the Wright brothers, and had never known the estimated figures to be more than 1 or 2 per cent. out from the measured result.

Coming to the lessons to be learned from the work of the Wright brothers, Col. Ogilvie pointed out that the first of these was the immense importance of fundamental research work, and another important one was the value of the closest co-operation between laboratory and field work. The lecturer stated that he did not wish to exaggerate the importance of the work of the Wright brothers, but he did desire to lay the strongest emphasis on the lessons to be learned therefrom, viz., that the whole basis of aeronautical progress rested upon general research in the laboratory, on the development of mathematical lines of attack, and on full-scale research work in the field.

The lecturer then indicated briefly the position of aeronautical research work in this country between the years 1909 and 1914, and with the research during the war period. He pointed out that during the War great progress had been made in the art of flying itself and in methods of construction, as well as in the actual power, reliability and efficiency of

engines. In coming to a consideration of the progress in aerodynamics, however, he thought it was accurate to state that substantially there had been no progress, and he pointed out that practically as much weight per horse-power could be carried in 1914 as in 1919.

Research in the Post-War Period

Col. Ogilvie then turned his attention to research in the post-War period, and this part of his paper we quote in full, as it deals with a subject which is of the utmost importance to the future of aviation:—

"Since the War, money and the national effort, as distinct from the individual effort, put into research have steadily dwindled, until it is safe to say that it is now far below the pre-War standard, when we had, as well as the establishment supported by State fund, a large amount of work being done by private firms and individuals. At the present date the few, extremely few, private firms who are left are so hard pressed to keep on their feet at all that they find it impossible to continue to devote their resources to anything outside the fulfilment of their definite orders.

"One of the most unfortunate results of the concentration during the War of all aeronautical matters into the hands of the State is that individual effort is now almost paralysed, and it is impossible for any one man, however broad-minded and far-sighted, to sympathise with all the wide aspects of aircraft research, particularly when continually harassed by orders to cut down his expenditure by so much per cent., as if he were a commercial traveller buying fire-irons. To all persons interested in sound aeronautical development it is only too evident that the importance of fundamental research to real progress in aircraft design is not grasped by those in authority in this country. Even the word research itself is very imperfectly understood. The initial problems are solved and technical development has gone far during the last ten years, but if the flying machine is to be of real benefit to the world in peace and to be a real means of rapid communication and of increase of friendliness among peoples, then big advances are necessary. Such advances are only to be obtained by laborious and systematic researches into the problems we can see dimly, as well as those we can see more clearly immediately in front of us.

"The immediate problems are those directed towards the improvement of the present type of aeroplane so as to increase its safety of operation. The main obvious defects are, that its minimum flying speed is too great and that the stability and controllability round about this speed are insufficient. It is foolish to put the responsibility for accidents on the engine and to say that all that is necessary is so to improve the reliability of engine and installation that breakdowns cannot occur. Certainly the majority of interruptions are traceable to some breakdown in the power plant in which greater experience and care will undoubtedly make big improvements; but it can never be the case that mechanical breakdowns are absolutely impossible, and it is essential that emergency landings can be accomplished without danger to the passengers or without even anxiety to the pilot.

"To the immediate future of civil aeronautics the importance of safety is paramount and supreme over all other considerations, and the efforts which are now being made in the laboratory and on full scale to improve stability and controllability round about stalling speed are all to the good. The other main problem, namely, that of decreasing the dangers at the landing itself, cannot be attacked in an adequate manner until funds are available. This problem has two branches—one a decrease in the minimum flying speed while keeping the top speed about the same, and the other an increase in the strength and efficiency of the landing mechanism itself.

"Further off we can see the big advances which will be possible when we have a real understanding of the action of an aerofoil in the air, and how and why the air flows round it and gives it lift and drag. A brilliant experiment may show, and indeed has shown, that we are on the outskirts of knowledge, but before we can attain the citadel we must give encouragement and adequate support to the men who are devoting themselves to fundamental research of this character.

"It is conceivable that lines of advance may then reveal themselves which would make it worth while to attempt even the design of a helicopter, but let us recognise that the present time is one requiring research work into the fundamental problems which must be solved before the world at large can reap the benefits of the wonderful achievement of Wilbur Wright and his brother."

THE ROYAL AIR FORCE

London Gazette, June 13, 1922

General Duties Branch

Sqdn.-Leader W. R. Read, M.C., D.F.C., A.F.C., Capt. 1st King's Dragoon Guards, is granted a permanent commn., with effect from November 17, 1921, retaining his present substantive rank and seniority. L. H. Cooper is granted a short service commn. as a Flying Offr. for three years on the active list, with effect from, and with seniority of, June 1. Pilot Offr. C. D. Robertson, M.M., to be Flying Offr.; April 29. Wing Commander A. V. Bettington, C.M.G., is restored to full pay from half-pay; June 1.

The following officers cease to be seconded for duty with Canadian Air Board:—Sqdn.-Leader R. Leckie, D.S.O., D.S.C., D.F.C., Flight-Lieut. J. A. Glen, D.S.C.; May 27. Flight-Lieut. J. A. Barron; June 1.

Flight-Lieut. H. O. Barnaby, M.B.E., is transferred to Reserve Class B; June 14. Flying Offr. A. V. Shewell is placed on retired list on account of ill-health contracted on active service, and is granted rank of Capt.; June 14. Obsvr.-Offr. R. B. Hunter relinquishes his short service commn. on account of ill-health contracted on active service, and is permitted to retain rank of Lieut.; June 14. Flying Offr. A. Bushfield is placed on retired list; May 31.

Stores Branch

Flying Offr. S. A. Martindale is removed from R.A.F. on conviction by Civil Power; May 2.

Memorandum

Major R. A. Cockburn, O.B.E., Suffolk Regiment, R.A.R.O., is granted permission to retain rank of Lieut.-Col., R.A.F., on retirement from Army.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

Wing Commander T. O. Lyons, O.B.E., from Headquarters, R.A.F., Iraq to R.A.F. Depot (Inland Area). (Supernumerary Non-effective.) 14.4.22.

Squadron Leaders.—A. J. O. Wigmore, M.B.E., from Palestine Wing Headquarters (Middle East) to No. 14 Squadron (Middle East). 26.4.22. H. J. F. Hunter, M.C., from No. 12 Squadron (Rhine) to R.A.F. Depot (Inland Area). (Supernumerary.) 25.5.22. (A./Grp. Capt.) H. C. Ellis, C.B.E., from General Services Pay Office (Inland Area) to R.A.F. Depot (Inland Area). (Supernumerary.) 1.5.22.

Flight Lieutenants.—R. B. Mansell, O.B.E., from No. 4 Flying Training School (Middle East) to No. 47 Squadron (Middle East). 8.5.22. E. N. E. Waldron, from No. 4 Stores Depot to R.A.F. Base, Gosport (Coastal Area). (Supernumerary.) 22.5.22. J. M. A. Costello, M.C. M.B., from Research Laboratory and Medical Officers' School of Instruction (Inland Area) to

R.A.F. Depot (Inland Area). 22.5.22. W. Duff Miller, M.B., to Research Laboratory and Medical Officers' School of Instruction (Inland Area) on appointment to short Ser. Commission. 15.5.22. W. H. L. O'Neill, M.C., from R.A.F. Base, Leuchars (Coastal Area) to No. 2 Flying Training School (Inland Area). 1.6.22. C. E. Wardle, from R.A.F. Depot (Inland Area) to No. 24 Squadron (Inland Area). 29.5.22. P. J. Wiseman, from Central Pay Office (Inland Area) to Inland Area Aircraft Depot (Inland Area). 25.5.22. N. R. Fuller, from R.A.F. Depot (Inland Area) to No. 4 Stores Depot. 29.5.22. L. Wanless-O'Gowan, from R.A.F. Depot (Inland Area) to No. 10 Group Headquarters (Coastal Area). (Supernumerary.) 1.6.22. Andrew Ronald Mackenzie, from No. 216 Squadron (Middle East) to Headquarters, R.A.F. (Middle East). 10.5.22. K. B. Lloyd, A.F.C., from R.A.F. Depot (Inland Area) to No. 2 Flying Training School (Inland Area). 11.6.22. A. E. Jenkins, from M.T. Repair Depot (Inland Area) to R.A.F. Depot (Inland Area) for duty as Medical Officer. 5.6.22.

IN PARLIAMENT

Aeroplanes for National Defence

CAPT. VISCOUNT CURZON, on June 13, asked the Secretary of State for Air what is the total number of aeroplanes available for the purposes of national defence, in a case of emergency, in Great Britain, France, Germany, and America?

Capt. Guest: I would refer to the figures given in reply to a question by Mr. L. Malone on February 24, which showed that some 773 aeroplanes were in active use in the Royal Air Force throughout the world, and that the total number of aeroplanes on the establishment of the Royal Air Force was 1,938. I do not consider it advisable in the public interests to state the number of aeroplanes available for national defence in an emergency, and any information I could give as to the number of aeroplanes available in other countries would have to be discounted in various directions before a comparison could be drawn.

Viscount Curzon: Is this question on the number of aeroplanes immediately available for national defence receiving the consideration of the Committee of Imperial Defence?

Capt. Guest: Yes, Sir, certainly.

Britain's Airworthy Aircraft

MAJ.-GEN. SEELY, on June 15, asked the Secretary of State for Air how many civil aircraft are now licensed by the Air Ministry as airworthy, and how many of this number are of value for war purposes; and can he give the comparable figures for the two preceding years?

Capt. Guest: The figure, on June 1 are as follows:—Number of aircraft holding Certificates of Airworthiness, 97 (1922); 137 (1921); and 240 (1920). Number of value for War purposes (including training), 83 (1922); 104 (1921); and 186 (1920).

There are probably in existence in this country at the present time considerably more than 97 airworthy aeroplanes, but owing to lack of employment and other causes, certain aeroplanes are laid up, and the owners have allowed the certificates to lapse. Though the 83 aeroplanes referred to above would be of some value for training and war purposes, it must be remembered that in this number there are no less than 28 different types of aeroplanes which reduces their military value considerably. In particular, very great difficulties would arise in maintaining and organising the issue of the necessary spares to keep all these different types serviceable for war purposes. Therefore, all that can be said is that they would be of some slight value.

Maj.-Gen. Seely: In view of the surprising and alarming decrease in our only reserve of air power, can the right hon. gentleman say, broadly—I cannot ask him to say in detail, in reply to a supplementary question—whether there is anything like that reduction in the case of other countries in their reserve fighting force in the air?

Capt. Guest: I think it would be better to study that question carefully. Perhaps my right hon. and gallant friend will put down a question.

Maj.-Gen. Seely: I will do so.

Aircraft Safety-Fuel Tanks

MR. G. LOCKER-LAMPSON, on June 16, asked the Secretary of State for Air if he has received complaints about the safety-fuel tank competition recently held at Farnborough; that tanks were selected for the final test, though they failed to pass the preliminary test for crashing; that tanks which crashed without bursting in the preliminary test were not allowed to enter the final; that only 8 out of 24 competitors were allowed to make weight and other modifications; that the tanks awarded the first three prizes failed in all tests in the final; and will he enquire into the matter?

Capt. Guest: The reply to the first question is that no complaints of the nature indicated have been received; to the second, in the negative; to the third, that a number of tanks which did not burst in the crashing test were excluded from the final test under the Regulations because they failed for other reasons; to the fourth, that all competitors were allowed to carry out any modification of detail they wished prior to the tests; to the fifth, that one design failed in the final tests, but the other two passed them successfully; and to the sixth and last, that I have already made enquiries into the matter, and I do not think that there is any reason for instituting further enquiries.

Aircraft in Aldershot Tattoo

DURING the three days' Tattoo held at Aldershot on Wednesday, Thursday and Friday of last week, aircraft helped to no small extent to make this famous spectacular

Civil Aviation

MR. MALONE, on June 19, asked the Secretary of State for Air if his attention has been called to the widespread criticism concerning the inefficiency and inadequacy of the policy of His Majesty's Government in regard to civil aviation; and when will he take an opportunity to make a statement to the House on this matter?

Capt. Guest: I have read a great many articles in the Press on the subject of civil aviation, containing an infinite variety of conflicting criticisms and suggestions, and I welcome this indication of increasing public interest in aeronautical subjects. The policy of the Ministry is, as I stated in my speech introducing the Air Estimates, to concentrate on the maintenance of the Continental air services, both in order to give experience and as a demonstration of what is now possible in competition with the most intense form of rail and sea transport in operation today. It is too soon yet to gauge the success, or otherwise, of the present subsidy scheme, as it has only been in operation a few weeks, but an opportunity can be taken to discuss the whole subject if the House so desires on the Civil Aviation Vote which is still on the Paper.

Mr. Malone asked the Secretary of State for Air if he is aware of the decreasing numbers of passengers carried on the London-Paris and other air routes; and what steps are being taken by the Controller of Civil Aviation to increase the safety and efficiency of these services?

Capt. Guest: The volume of passenger traffic across the Channel is being carefully watched. Actually, for April and May of this year the numbers carried on the London-Paris route were approximately equal to the numbers for those months last year, but there was a considerable decrease during the first two weeks of June. The British lines are carrying a larger proportion of these passengers than was the case last year. About 50 per cent. more aircraft are being employed on the Continental routes, and on an average each of these aircraft is flying more than twice as much as was the case last year. Consequently, more than three times the seating accommodation is available this as compared with last year for approximately the same traffic. An official air route between London and Paris has been settled in consultation with the French and Belgian authorities. A similar air route to Brussels has been selected this week by our experts, but must be referred to the French and Belgians for concurrence. General rules for flying along these and other official routes are being issued. New rules for taking off and landing at Croydon aerodrome have been drawn up and are now in force. All such regulations will be posted in a prominent position on the aerodrome.

Periodic conferences between the Air Ministry officials, representatives of operating firms, and pilots actually flying on the cross-Channel air routes are being arranged for the purpose of discussing measures of safety and means of obtaining reliability of service in the future. By means of these meetings, pilots will also be given instructions regarding the care and use of the latest instruments, and kept up to date in the progress of air navigation. A system is being introduced by which a pilot's licence can be endorsed, suspended or withdrawn for acts of neglect, carelessness or dangerous flying. The work of ground engineers licensed by the Air Council will be more closely supervised than formerly, and further qualifications in ability to inspect and maintain instruments will shortly be demanded from them. Operating firms are being requested to report fully on all cases of engine failure and engine trouble, and each case will be investigated by experts with a view to eliminating the causes. More stringent rules regarding the use of radio-telephony by pilots are being introduced with the objects of providing more rapid information of weather conditions along the route and of preventing interference between aircraft. A fixed time-table for aircraft flying along the route is being drawn up in order that pilots may know approximately what aircraft are flying near them at any given time. The question as to whether the provision of an assistant pilot should be made compulsory is under consideration. It is a complicated question, and cannot be decided hastily; meanwhile, the carriage of passengers seated beside the pilot has been forbidden.

display a success. The principal feature of the aerial side was the wonderful flying by Flight Lieuts. T. E. B. Howe and J. A. G. Haslan; and Flying Officer A. J. Warwick—all from Andover—on Bristol Fighters.

THE LONDON AERO-MODELS ASSOCIATION (The Society of Model Aeronautical Engineers.)

THURSDAY next, the 22nd inst., a discussion will be held on Dr. Hankin's lecture with reference to the best method of experimenting with models for the purpose of attaining soaring flight, and it is hoped that members will bring along wings built up on the flying-fish principle for demonstration purposes.

On Thursday, the 29th inst., Mr. F. Handley Page has kindly arranged for Mr. Reynolds, of the Handley Page Research Department, to read a paper before the members at Headquarters, 20, Great Windmill Street, Piccadilly, W., the title of which will be "The Handley Page Slotted Wing," illustrated by lantern slides. Dr. A. P. Thurston, D.Sc., will preside. Visitors will be welcomed, but, owing to limited accommodation, should notify the Hon. Secretary, A. E. Jones, 48, Narcissus Road, West Hampstead, N.W. 6. Time of lecture, 7.30 p.m.

"Flight Golf" Competition for "Flight" Challenge Cup

Wimbledon Common, Saturday, July 8, 1922, at 5 p.m.
Competitors to assemble at 4.30 p.m.

Rules

1. The Competition to be open.
2. Non-members to pay a 2s. 6d. fee for each entry.
3. The prize shall be awarded to the competitor who completes the arranged course in the smallest number of flights.
4. The course to be flown over will be in the form of a pentagon, each side measuring 150 yds.
5. The bases shall be indicated by white flags, attached to which are two cords having a radius of 10 yds. and 20 yds. respectively.
6. The models must start the course from No. 1 base with an R.O.G. flight, and must be in the air at least 10 secs. (two attempts being allowed) or be disqualified.
7. All models must arrive at each base entirely under their own power, the circle of 20 yds. radius prescribing the maximum distance that may be "taxied."
8. The direction of course from No. 1 to No. 2 base will be into the wind.
9. A time allowance of 60 mins. will be allowed for rubber-driven models to complete the course, and 75 mins. for models driven by mechanical power—this time to include repairs.
10. The maximum loading allowed will be 8 ozs. per sq. ft., reckoning lifting surface only.
11. After the flight from ground mentioned in Rule 6, all models must continue the course with their landing gear intact or be disqualified.
12. In the event of bad weather conditions prevailing, the judges reserve the right to alter the course or postpone the Competition.
13. All entries for the Competition shall be numbered consecutively as received by the Hon. Competition Secretary, and duplicate numbers issued to the competitors, which must be conspicuously displayed on the entrant's model.
14. Any type of model aircraft is eligible.
15. Competitors must be at the starter's flag, ready to fly, five minutes before 5 p.m. on Saturday, July 8, 1922, otherwise they will be disqualified.
16. The closing date for all entries shall be Saturday, July 1, 1922.
17. The Cup shall be held by the competitor adjudged the winner until such time as his record shall be beaten; or in the event of no challenger appearing or the record not being broken, for a period of one year or such other period as may be determined by the Committee.

PUBLICATIONS RECEIVED

Traite Pratique de Navigation Aérienne. By A.-B. Duval and L. Hebrard. Paris: Gauthier-Villars et Cie., Quai des Grands-Augustins, 55.

Woodwork Tools and How to Use Them. The Woodworker Series. London: Evans Brothers, Ltd., Montague House, Russell Square, W.C.1. Price 4s. 6d. net.

Report No. 125. Aeronautical Instruments: Section I. General Classification of Instruments and Problems including Bibliography. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

Technical Note No. 98. Notes on the Design of Latticed Columns Subject to Lateral Loads. By C. J. McCarthy. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

SIDE-WINDS

REALISING how easy it is to lose that little file for cleaning contact points on magnetos, etc., the Fellows Magneto Co., Ltd., have produced a natty pocket file, which, when ready for the pocket, looks just like a fountain pen. The file is mounted in a handle made of some xylonite substance, while a cap of similar material protects the tool when it is off duty. It can be had in a number of colours, and all you have to do is to send along a postal order for 1s. 6d. to the Fellows Magneto Co., Park Royal, Willesden, N.W. 10.

REFERENCE has already been made in these columns to the compensating gear with which the Bristol "Jupiter" and "Lucifer" engines are fitted. This gear ensures that when the cylinders expand, the rockers are shifted in such a way that the actual tappet clearance remains unaltered. In large air-cooled cylinders, such as those of the Bristol engines, the amount of expansion may amount to a good deal, and there is little doubt that the gear assists very materially in the smooth running of the engines. It is of interest to note that this valve compensating gear is the invention of Mr. Raymond Morgan, who holds the patents. The exclusive aircraft rights of the Morgan compensating gear have been acquired by the Bristol Aeroplane Company, of Filton, Bristol, to whom should be addressed all enquiries for licences to manufacture in connection with aero engines. For all other applications, such as to stationary and marine engines, motor-cycle and motor-car work, etc., those interested should apply direct to the patentee, Mr. Raymond Morgan, 8, Clifford's Inn, London, E.C. 4.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motors. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1920.

Published June 22, 1922.

35,116. A. P. THURSTON and BRISTOL AEROPLANE CO., LTD. Aircraft submarines. (180,359.)

APPLIED FOR IN 1921.

Published June 22, 1922.

- 5,640. SOC. DES ETAB. GAUMONT. Gyroscopic compasses. (180,413.)
5,825. RAOUL, MARQUIS OF PATERAS PESCARA. Helices for helicopters. (159,207.)
5,902. D. M. RAMSAY. Power plant for aircraft. (180,423.)
5,908. RAOUL, MARQUIS OF PATERAS PESCARA. Propellers having variable and reversible helicoidal torsion. (159,224.)
6,165. A. H. R. FEDDEN and BRISTOL AEROPLANE CO., LTD. Valve gear for I.C. engines. (180,436.)
7,547. T. R. CAVE-BROWN-CAVE. Propellers. (180,455.)
8,336. C. J. STEWART and E. A. GRIFFITHS. Computing-scales for use with aircraft measuring instruments. (180,467.)
8,368. J. R. PORTER. Aeronautical machines. (180,467.)
14,745. J. F. O. DIDELOT. Propulsion means for use in air and water. (164,020.)
16,060. S. MARSEK. Planes. (180,570.)
19,404. R. PURVES. Torpedo suspension gear for aircraft. (180,591.)

NOTICE TO ADVERTISERS

All Advertisement Copy and Blocks must be delivered at the Offices of "FLIGHT," 36, Great Queen Street, Kingsway, W.C.2, not later than 12 o'clock on Saturday in each week for the following week's issue.

FLIGHT

The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C.2.

Telegraphic address: Truditur, Westcent, London.

Telephone: Gerrard 1828.

SUBSCRIPTION RATES

"FLIGHT" will be forwarded, post free, at the following rates:—

UNITED KINGDOM		ABROAD*	
	s. d.		s. d.
3 Months, Post Free...	7 7	3 Months, Post Free...	8 3
6 " " "...	15 2	6 " " "...	16 6
12 " " "...	30 4	12 " " "...	33 0

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates.

* European subscriptions must be remitted in British currency

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT," 36, Great Queen Street, Kingsway, W.C.2, and crossed London County and Westminster Bank, otherwise no responsibility will be accepted.